ASPI
AUSTRALIAN STRATEGIC POLICY INSTITUTE

The Cost of Defence

ASPI Defence Budget Brief 2011–2012

$72,766,619.18 $72,766,619.18 $72,766,619.18 $72,766,619.18 $72,766,619.18 $72,766,619.18 $72,766,619.18 $72,766,619.18

Seventy-two million, seven hundred & sixty-six thousand, six hundred & nineteen dollars & eighteen cents **per day**

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Cover graphic; HMAS *Sirius* in turbulent seas.
Photo courtesy of Department of Defence.

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Note on title:

The figure of $72,766,619.18 represents one three-hundred-and-sixty-fifth of reported Total Defence Funding for financial year 2011–12. This does not include funds appropriated to the Defence Housing Authority, those administered by Defence for military superannuation schemes and housing support services, nor the additional funds provided directly to the Defence Materiel Organisation.

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EXECUTIVE DIRECTOR'S INTRODUCTION

This is ASPI's tenth annual Defence Budget Brief. Our aim remains to inform discussion and scrutiny of the Defence budget and the policy choices it entails.

As has been the custom in the past, we explore new areas in this year's brief. A chapter on *International Burden Sharing* has been added, and we've resurrected the issue of *Defence Transparency* to take account of recent developments. In addition, the material dealing with Defence Outputs has been refined to better cover the Defence Programs.

The chapter we introduced two years ago entitled *Selected Major Projects* makes a return with the assistance of our colleagues at the *Australian Defence Magazine*, Gregor Ferguson and Tom Muir. This section has once again been capably edited by ASPI's Andrew Davies.

Finally, the not inconsiderable task of preparing the document for publication has been ably taken care of by Janice Johnson. Many others have helped by providing comments, offering advice, and checking facts. Our thanks go out to them all.

Also, Defence was kind enough to look over a preliminary draft of this brief and provide valuable comments. This helped clarify some important points and resulted in improved accuracy in many areas. Of course this does not in any way imply that Defence endorses this document or even supports its conclusions.

My colleague Dr Mark Thomson, who is the Manager of ASPI's Budget and Management Program, has once again pulled together the brief in the short time available. For this I extend my sincere thanks. As always, responsibility for the judgements contained herein lie with Dr Thomson and me alone.

Lastly we should acknowledge that we at ASPI are not disinterested observers of the Defence budget. Our funding from government is provided through Defence at the rate of seven thousand, five hundred and eighty-three dollars and fifty-six cents ($7,583.56) per day. Details can be found in our 2009-10 Annual Report.

Peter Abigail
Executive Director

EXECUTIVE SUMMARY

In 2009 the government did something that had never been done before. They simultaneously launched a Defence White Paper, *Force 2030*, and a major defence reform program, the *Strategic Reform Program* (SRP). This was not a coincidence. The two were inextricably linked; the ambitious modernisation of the defence force in *Force 2030* was explicitly contingent on the SRP delivering savings of $20.6 billion over the forthcoming decade.

This year's budget provides an opportunity to assess progress on both fronts. To understand what's happening, here are the key developments from the May budget.

Defence Budget 2011

Defence spending 2011-12:	$26.5 billion
Share of GDP:	1.8%
Share of Commonwealth spend:	7.3%
Real growth on prior year:	4.2%
Four-year past trend:	4.0% pa
Four-year future trend:	0.1% pa

Expenditure shares

Personnel:	$10.1 billion	(38.1%)
Operating:	$9.4 billion	(35.4%)
Investment:	$7.0 billion	(26.6%)

Cost of deployments

Afghanistan:	$1.7 b	($7.0 b since 2001)
East Timor:	$160 m	($1.6 b since 1999)
Solomon Islands:	$43 m	($0.3 b since 2003)

Key budget measures

↓ $4.3 billion cut from budget to 2019
↓ $2.4 billion in investment deferred to past 2014

Adjustments and supplementation

↓ $2.4 billion returned due to appreciation in A$
↑ $1.3 billion in supplementation for deployments

Defence will hand back $1.5 billion of funding this financial year, including $1.1 billion of investment funds and $400 million from recurrent spending. In light of this dual underspend; a further $1.3 billion of previously planned investment has been deferred to beyond 2014, and $3.9 billion of recurrent funding planned for the next decade has been returned to the government.

By themselves, these facts are hardly revealing. Indeed, on the surface it might be concluded that the government is simply taking money from Defence to ensure it can deliver a surplus in 2013. But this is certainly not the case—especially given that the cuts and deferrals are not centred on that year. Instead, the steps taken in this year's budget are symptoms of serious problems with Defence's financial management and capability development planning. These are examined below.

The *Defence Capability Plan* and *Force 2030*

Since 2000, the development of the defence force has been based around a long-term program of planned investment in new equipment; the *Defence Capability Plan* (DCP). The latest public version of the plan was released in December 2010 and covers the decade to 2019. It tells us about the acquisition projects which Defence plans over the next decade in pursuit of *Force 2030*, the defence force envisaged in the 2009 White Paper. Given the inherently extended time needed to deliver defence projects, the current ten-year plan probably contains 75% of the additional equipment that will form the force structure in 2030.

Defence's incoming government brief from late last year said that the 'implementation of *Force 2030* is on track but under pressure'. No such claim appears anywhere in this year's budget paraphernalia. Nor, however, is there any concession

of the contrary. Instead, Defence distributed a brief on Budget Night that said that the 'majority of adjustments to funding for Force 2030 projects in the Budget involve projects commenced before the 2009 Defence White Paper'. And lest anyone be confused, they reiterate the same point four times on the one page. As if only the handful of projects commenced after the 2009 White Paper count towards *Force 2030*.

They can change the goalposts all they want, but the fact remains that implementation of *Force 2030* has fallen steadily behind schedule over the past two years. First-pass approvals—the lead indicators of future activity—are most telling. Over the past 24 months, a mere ten projects have been given the nod, whereas more than three times that number was planned. And it is set to get worse. According to the latest revision of the public DCP, around 58 first-pass approvals are going to be required over the next 25 months to meet the current schedule as updated in this year's budget. While the situation with second-pass approvals is not quite as bad, it is hardly more encouraging (especially given that a great many future second-pass approvals are contingent on the mounting back-log of first-pass approvals).

Even taking the disruption due to the election into account (which should not have come unexpected) the rate of approvals has been disappointing. However, it is not surprising. Since the adoption of the two-pass process in 2004, approvals have taken significantly longer to achieve than in the past. Defence is taking steps to respond to the situation by expanding, diversifying and up-skilling its capability development workforce. While this is to be commended, such programs take time and cannot be relied upon to deliver a rapid turn-around.

If the reality gap between past and planned approvals was all we had to worry about, things would be bad enough. But it gets worse. Because of the deferral of defence funding back in 2009 to accommodate the fiscal impact of the Global Financial Crisis, baseline defence spending (exclusive of operational supplementation) will decline towards 2012-13—the year in which the government plans to return to surplus. After that, it rises quickly to regain the promised '3% real growth' over the decade.

The trouble is that most of the contraction and subsequent growth is concentrated in the major capital investment program. As best we can estimate, this means that spending on new equipment is set to rise by in excess of 100% in a period of only four years. This seems optimistic in the extreme given that most of the delays experienced this year reflect the non-delivery of approved projects by industry. Unless the plan is to buy a massive quantity of new equipment off-the-shelf from overseas, this rapid expansion will sorely test the capacity of industry at the same time as they compete for skilled workers in what's shaping up to be the largest mining boom in Australia's history.

And to complicate things further, there's a White Paper planned for 2014 (not to mention an election the year before), which will be highly disruptive of progress if past experience is anything to go by.

Thus, as things stand, Defence's force development plans over the next several years are simply unrealistic. And the deferrals in this year's budget only made things worse

by amplifying the bow wave of approvals and spending ahead. In fairness, however, today's problems were largely built into the program back in 2009.

There is no point clinging to existing plans. The development of the ADF needs to be put on a realistic and sustainable footing. Existing resources need to be directed towards approving a manageable program of new projects that can feasibly be delivered by industry over the next several years. This will mean focusing efforts on those capabilities most urgently needed by the defence force and deferring others into the future. Doing so will demand much more than tweaking the existing program at the margin. A comprehensive audit of Defence's present capability plan is required to get *Force 2030* onto a track that does not lead to a train wreck.

At the same time, the government needs to take action to close the gap between the capacity of Defence to prepare projects for approval and the demands of the two-pass approval process. Efforts underway to boost the capacity of Capability Development Groups should be given a high priority. And at the same time, however, the government needs to also ensure that the increasingly labyrinthine two-pass process is not wasting time in a futile effort to avoid the intrinsic risk that accompanies many defence acquisitions. Risk should be managed not avoided.

The *Strategic Reform Program* and the *Defence Funding Model*

A centrepiece of the 2009 White Paper was a 21-year funding commitment built around 3% real growth to 2018 and $20.6 billion worth of savings from the SRP over the first decade. Following the GFC-induced deferral of funding in 2009 from the initial four years, 3% real growth was qualified to be 'average real growth'.

Although it's claimed the SRP savings are being redirected to fund *Force 2030*, nothing of the sort is occurring. The budget is what the budget is. Instead, the savings are notional quantities relative to a counterfactual 'business as usual' baseline of what it *would* have cost to deliver capability absent the reforms. While this does not mean that the savings are somehow less real, it does make them contingent on the credibility of the what-would-have-been baseline.

For two budgets now, we've examined the SRP savings program and compared it with what limited concrete data can be found in the public domain. Our conclusion is twofold: First, the SRP is leading to substantial and worthwhile changes to the way Defence does business. Moreover, there are real and significant savings being made. These are most apparent in the area of capability sustainment where Defence and industry have been working together to find innovative ways to maintain equipment more cheaply than in the past.

Second, notwithstanding the efficiency gains that have been made, the overall scale of savings claimed is not credible. Not just because many of the claimed savings (around $5 billion worth) are nothing more than the shifting of expenditure from one category to another without any reform, but because the remaining savings tend to be relative to implausibly high baselines. The interested reader should consult Chapter 4 in this and last year's budget brief for details.

Reading this year's budget, a rather different story is told. The SRP has been so successful that still further savings above and beyond the initial $20.6 billion are

ready to be harvested—$3.9 billion over the next decade to be exact. At this rate, the Defence budget could disappear like the Cheshire cat in *Alice in Wonderland* leaving only a smile behind.

While some of these additional savings (and the $400 million returned this year) reflect delays in introducing new capability into service, it's increasingly clear that Defence was simply granted too many additional resources in the 2009 White Paper. Consider civilian personnel. Around $300 million of the new savings come from reducing planned civilian numbers by 1,000 over the next three years. But the reality is that Defence never needed the 1,000 positions in question. Last financial year they got by with 645 fewer people than planned and this financial year they got by with 1,205 fewer than they said they needed. The 1,000 positions that were cut were never filled. Yet, even after claiming the savings from having a thousand fewer civilians, the average strength of the civilian workforce next year is still planned to grow year-on-year by 992 positions.

The time has come to stop pretending that Defence is a bottomless rabbit hole of savings and efficiencies. It undermines the credibility of the good work that is being done by the SRP to deliver better value-for-money to the taxpayer. Moreover, it obscures the fact that Defence's financial management system is broken. If Defence couldn't predict what it needed for this year's budget, it's hard to accept claims of multi-billion savings years ahead based on a long-range understanding of business-as-usual costs.

There are no quick solutions to this problem. It will take several years to develop the management information systems that Defence needs, and even then the effort will fail without a sensible business model that aligns accountability and control of resources. Hopefully, the soon to be released response from the government to last year's review of accountability will get things rolling. But that can only be the first step. Improved financial management has been promised many times over the past twelve years, and yet it remains elusive. Indeed, it is far from clear that a credible plan exists to achieve this. If there is, let's see it so that we can track the milestones.

Until financial planning and control is put on a solid basis, the Defence budget will have to be managed from year to year as more is learnt about what it will cost to operate the raft of new capabilities set to enter service. It is entirely possible that the situation could revert from feast to famine in a relatively short time—such are the uncertainties in Defence's understanding of its costs.

Conclusion

This year's budget showed that there are serious problems with Defence's capability planning and financial management systems. Firm action is urgently required on both fronts. This might be best done by bringing forward the next White Paper to sort things out—or at least doing a more limited Defence Update. Whatever happens, no progress will be possible by clinging to unfeasible plans and funding models that clearly exceed Defence's capacity to spend. This means an end to the iconic promise of 3% real growth in defence spending that has hung like a lodestone around the necks of successive governments. Defence should only be given as much money as it can sensibly spend.

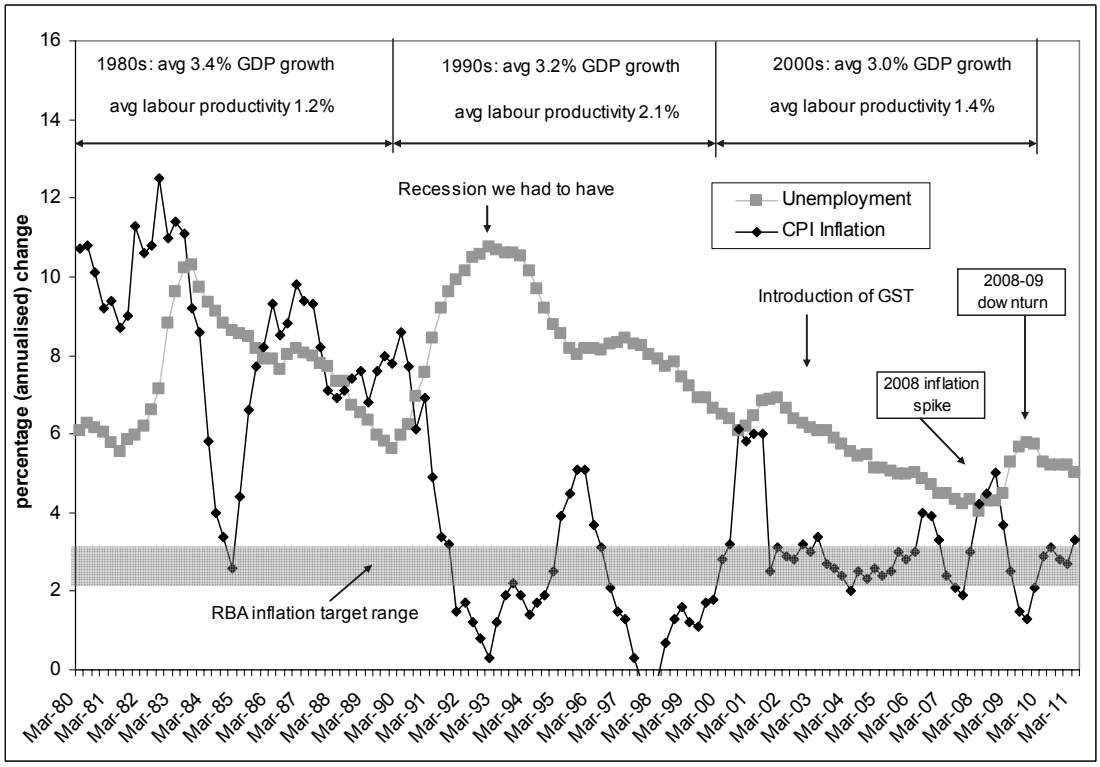
CHAPTER 1 – BACKGROUND

1.1 Economic Context for the Budget

From the early 1990s until late 2008, Australia enjoyed relatively favourable economic conditions, see Figure 1.1.1. Three things stood out:

- In the 1990s, inflation fell to effectively half what it was in the 1970s and 1980s, notwithstanding a short-lived spike in 2008.
- Economic growth was healthy, averaging 3.4% during the 1990s and 3.2% from 2000 to 2007, despite a fall in labour productivity growth.
- Unemployment fell from a peak of 10.8% in late 1992 to a thirty-four year low of 4% in early 2008 (at the same time as workforce participation edged up from 62.7% to 65.2%).

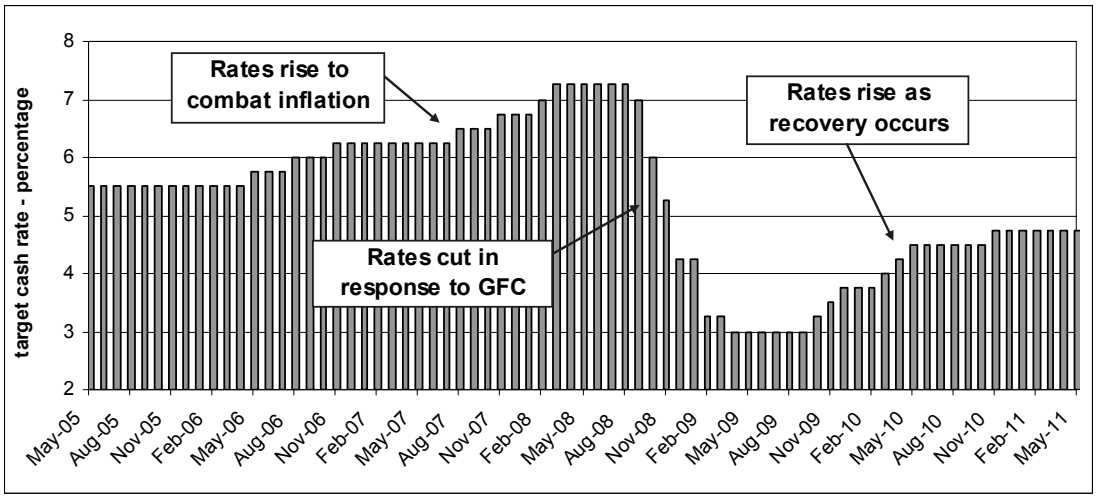
Figure 1.1.1: Australian economic performance 1978 to 2008



Source: Reserve Bank of Australia (RBA), Australian Bureau of Statistics (ABS) and Treasury statistics

Strong economic growth allowed the previous government to simultaneously increase spending and cut taxes in its later years. It was a happy time all around. Few areas were happier than Defence, which saw its funding grow more or less in tandem with GDP from 1999 onwards. But from around 2004, when unemployment fell below 5%, capacity constraints started to be felt in the economy and in 2008 inflation began to rise quickly. Then, in late 2008, the Global Financial Crisis (GFC) hit and it looked like a substantial recession was on the cards. But Australia weathered the economic storm better than expected, and rather than an outright recession we experienced only a limited slowdown. And since late 2009, a recovery has been underway with falling unemployment and rising interest rates. The timing of the recent events is reflected in the changes to the RBA target cash rate set out in Figure 1.1.2.

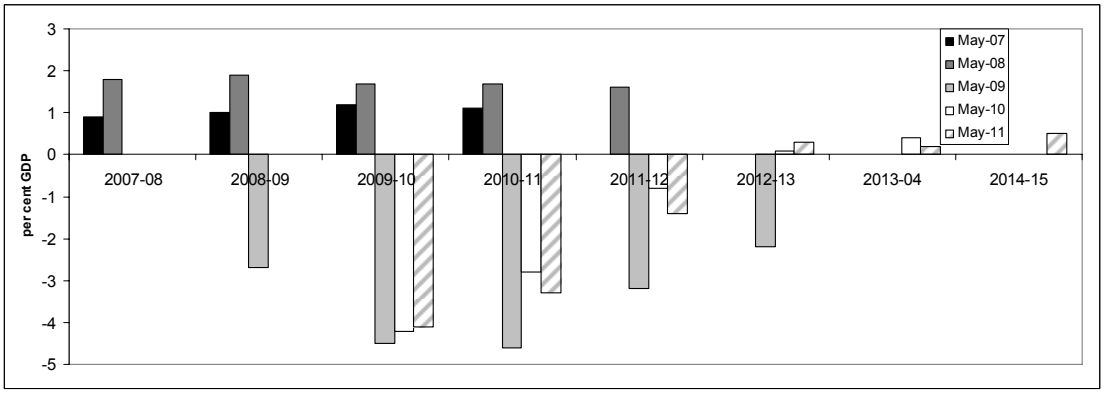
Figure 1.1.2: RBA target cash rate 2005 to 2011



Source: RBA.

The onset of the GFC was accompanied by a deterioration of the government's fiscal outlook. Figure 1.1.3 graphs the dramatic changes to the fiscal outlook in successive official estimates in recent years. Note that a return to surplus is now anticipated in 2012-13. Table 1.1.1 compares the outlook in May 2010 with that of today. Note that a series of natural disasters in late 2010 and early 2011 contributed to larger than initially planned deficits in 2010-11 and 2011-12.

Figure 1.1.3: The changing outlook—fiscal balance per cent GDP



Source: 2007-08 to 2011-12 Budget Papers

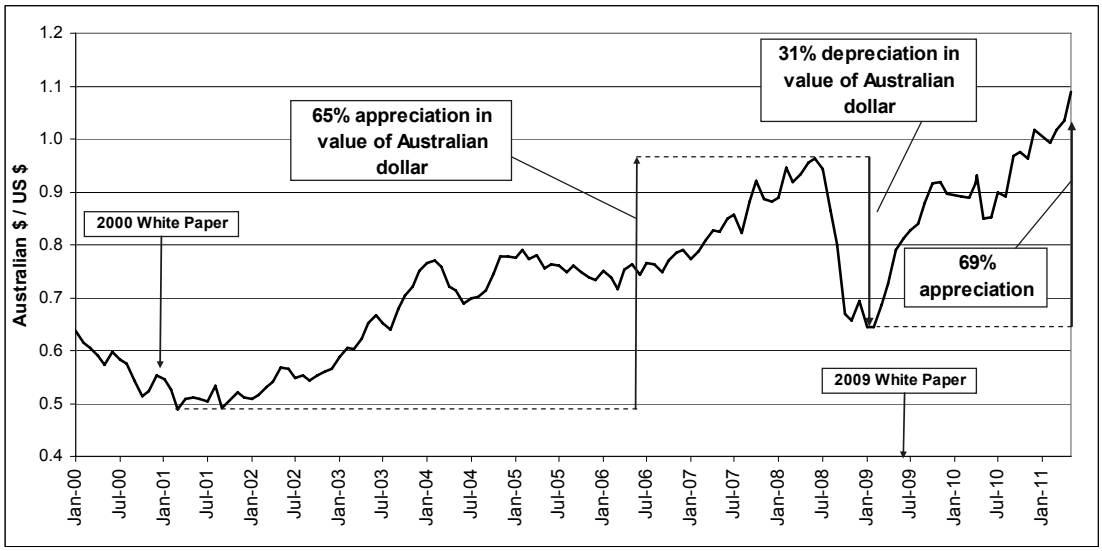
Table 1.1.1: Budget aggregates 2010-11 and 2011-12 Budgets (nominal billion dollars)

		07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15
Budget 2010-11	Underlying cash balance	**19.7**	**-27.1**	**-57.1**	**-40.8**	**-13.0**	**1.0**	**5.5**	
	Per cent of GDP	1.7	-2.2	-4.4	-2.9	-0.9	0.1	0.3	
	Fiscal balance	**21.0**	**-29.7**	**-54.2**	**-39.6**	**-12.1**	**2.0**	**6.3**	
	Per cent of GDP	1.9	-2.4	-4.2	-2.8	-0.8	0.1	0.4	
Budget 2011-12	Underlying cash balance	**19.7**	**-27.1**	**-54.8**	**-49.4**	**-22.6**	**3.5**	**3.7**	**5.8**
	Per cent of GDP	1.7	-2.2	-4.3	-3.6	-1.5	0.2	0.2	0.3
	Fiscal balance	**21.0**	**-29.7**	**-52.9**	**-45.7**	**-20.3**	**4.0**	**3.2**	**8.5**
	Per cent of GDP	1.9	-2.4	-4.1	-3.3	-1.4	0.3	0.2	0.5

Source: Budget Papers No. 1 for 2010–11 and beyond, 2007-08 to 2009-10 are 'actual' figures.

Defence spends something like $5 billion a year offshore (no official figure is available) mostly in contracts written in US dollars. And while Defence is insulated from fluctuations on a no-win, no-loss basis with the Department of Finance and Deregulation, the government, and ultimately the taxpayer, feels the pain or gain. In recent years, the USD–AUD exchange rate has fluctuated substantially as Figure 1.1.4 shows. At the time of writing, the exchange rate was continuing to appreciate having reached a post-float high of $1.10 against the US dollar.

Figure 1.1.4: Foreign exchange



Source: RBA

Since 2009-10, the defence budget has received fixed 2.5% annual indexation. (This is separate from and in addition to the adjustments made for foreign exchange). The relative percentage gain or loss compared with CPI and 'core' inflation is calculated in Table 1.1.2, including historical figures for comparison.

Table 1.1.2: CPI inflation, 'core' inflation and 2.5% indexation

	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15
Fixed 2.5%	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
CPI	2.9	3.1	2.4	2.4	3.2	2.9	3.4	3.1	2.3	3.25	2.75	3.0	2.5	2.5
Difference	-0.4	-0.6	0.1	0.1	-0.7	-0.4	-0.9	-0.6	0.2	-0.75	-0.75	0	0	0
Fixed 2.5%	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
'core' inflation*	3.0	2.9	2.6	2.5	2.6	2.8	3.7	4.3	3.1					
Difference	-0.5	-0.4	-0.1	0.0	-0.1	-0.3	-1.2	-1.8	-0.6					

Source: APH Library, RBA, ABS and Budget Papers
* Average of the RBA weighted median and trimmed mean price inflation measures.

Because of the rise in inflation accompanying the recovery from the GFC downturn, the CPI is presently running well above the 2.5% benchmark. As a result, the buying power of the Defence budget is being slowly eroded. The impact of the new indexation regime on the Defence budget is explored further in Chapter 3.

1.2 Defence Organisation and Management

The Outcomes and Program Framework

Since 2009-10, the Defence budget has been set out according to a framework of 'outcomes' and 'programs'. This replaces the 'outcomes' and 'outputs' framework that was established in 1999.

- **Outcomes** are the results or benefits that the Commonwealth aims to deliver to the community through the work of its agencies. They are specified for each agency, and are meant to express the purpose or goal of each agency's activities.
- **Programs** are activities that agencies undertake in pursuit of the outcomes they are expected to deliver.

Under the framework, the performance of agencies is measured. This is done through specific targets (like flying hours for Air Force) and, ultimately, the extent to which their programs actually deliver the outcomes intended. So the aim is to show not only how much an agency is *doing*, but how much it is actually *achieving.*

The Defence Outcomes

Since 2009-10, the Defence Outcomes have been:

Outcome 1: The protection and advancement of Australia's national interests through the provision of military capabilities and the promotion of security and stability.

Outcome 2: The advancement of Australia's strategic interests through the conduct of military operations and other tasks as directed by Government.

Outcome 3: Support for the Australian community and civilian authorities as requested by Government**.**

The programs that contribute to these three outcomes are set out in Figure 1.2.1. Note that the programs are closely aligned with the actual organisational structure of Defence, as can be seen by comparison with the Defence 'wiring diagram' in Figure 1.2.2.

This framework provides greater visibility of resources consumption within the organisation than the output-based approach that was in place up to 2007-08. But this comes at the loss of knowing what it costs to deliver military capability, which is what the old framework attempted to do. Ultimately, what really matters is how much it costs to deliver ships, planes and battalions ready for deployment, not how much money is spent on health services, legal advice or personnel management. Of course, in a perfect world we would be told both.

Curiously, at the same time as Defence's formal budget framework abandoned the concept of outputs in favour of an organisation-based program approach, the 2009 White Paper said that Defence will move to an output-driven internal budgeting model. Twenty-four months on, and it is still too early to know what this will entail or the extent—if any—to which it will be visible to the public. It would be ironic if Defence finally moved to an internal output-based budget so soon after abandoning output-based external budgeting and reporting.

Figure 1.2.1: The new Defence Outcome-Output framework

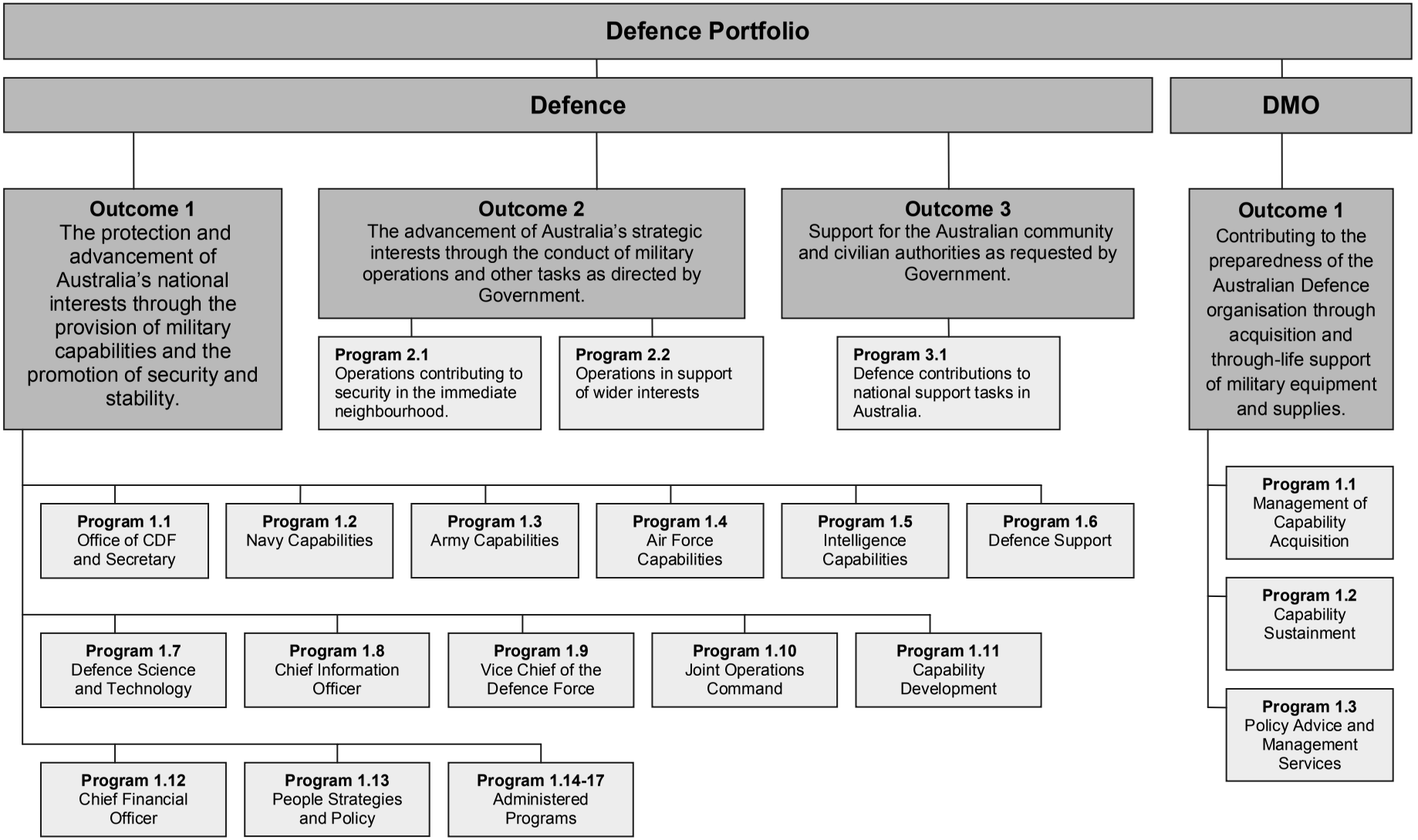
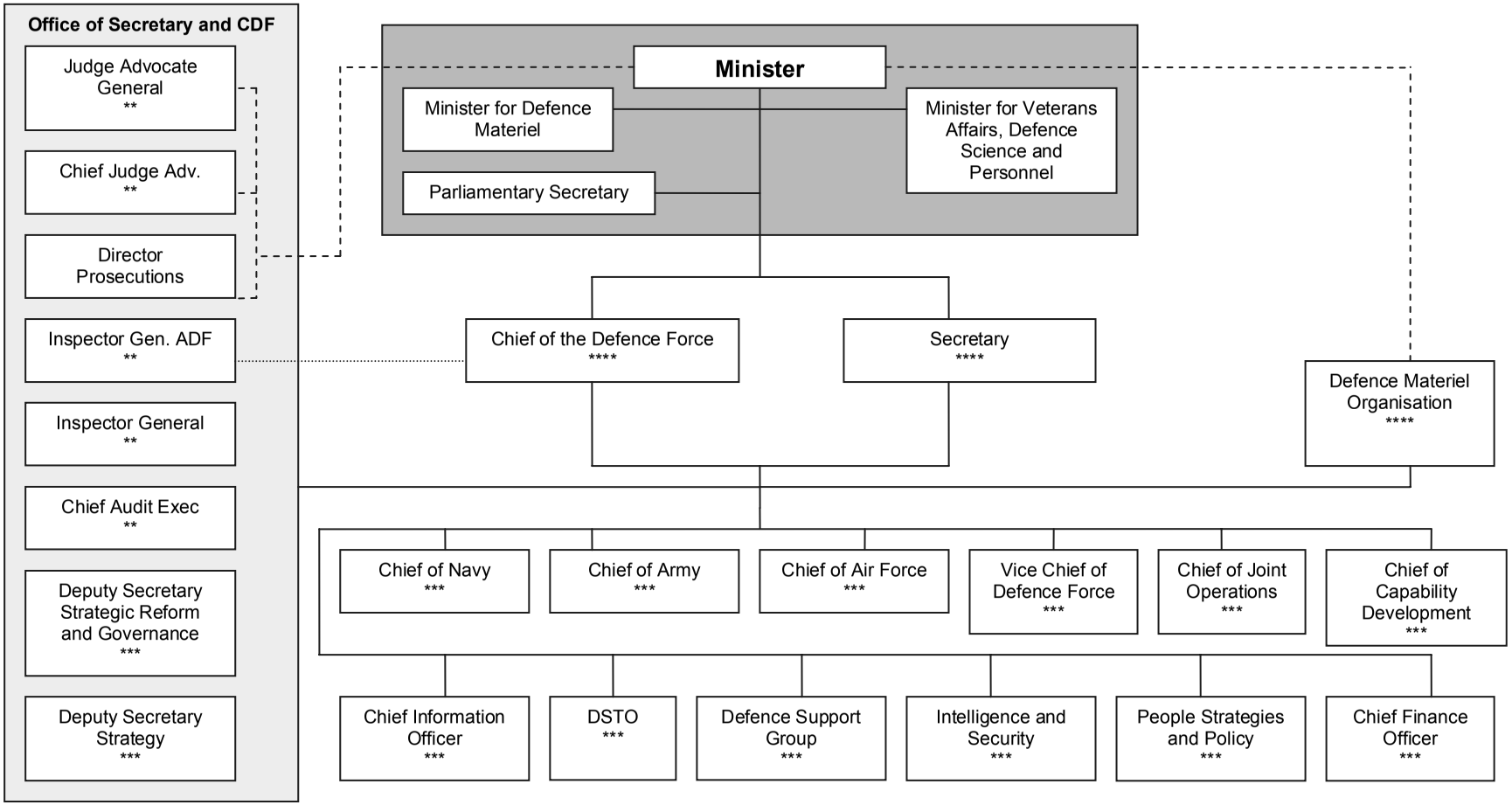


Figure 1.2.2: Defence organisational structure (as at May 2011)



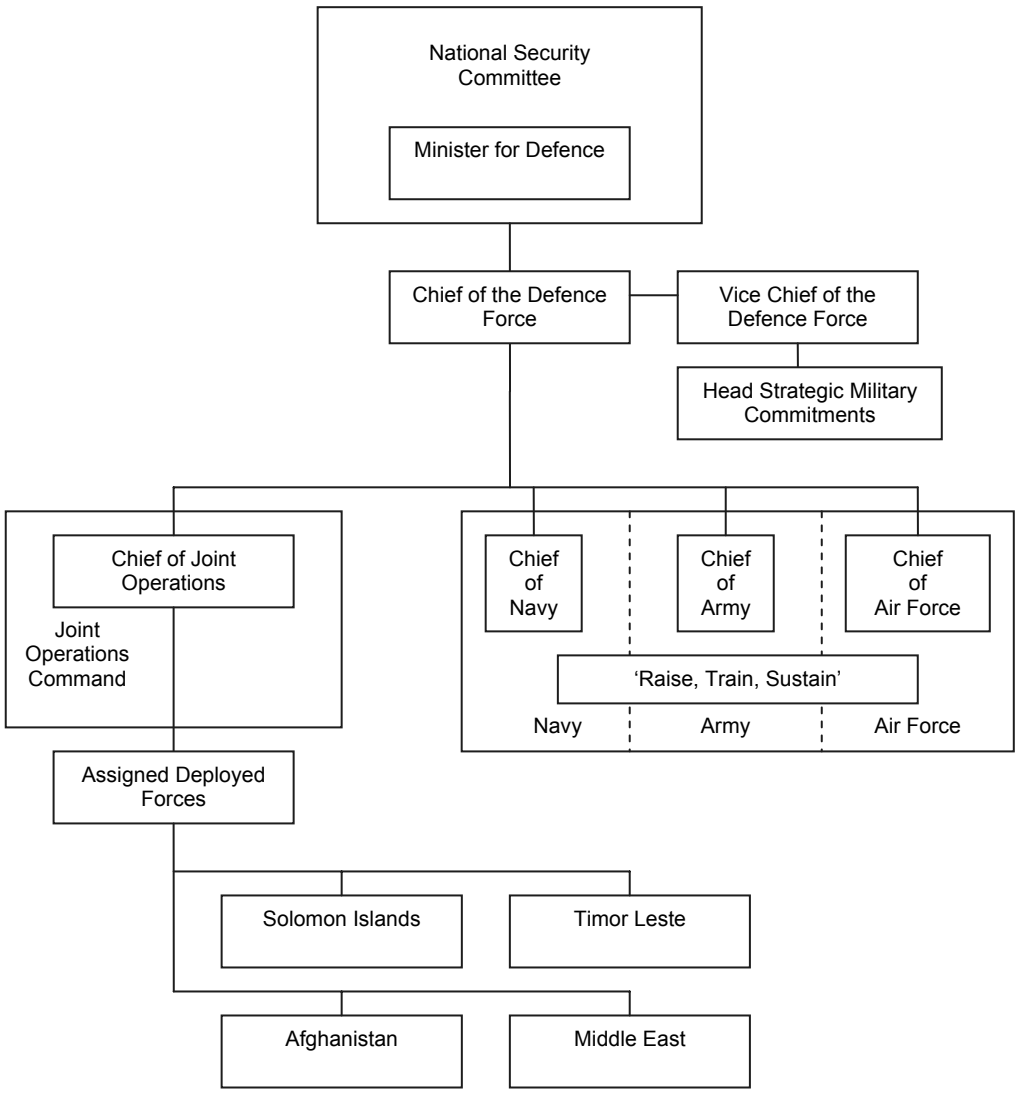
ADF command structure

It is important not to confuse the day-to-day management of the Department of Defence with the command of military operations. The former occurs through the diarchy of the CDF and Secretary and group/program arrangements outlined above. The latter is exercised through a formal command chain and dedicated headquarters structure.

On a day-to-day basis, the three Services (Navy, Army, and Air Force) are responsible for raising, training and sustaining their forces. When forces are deployed on operations or major exercises, the designated force elements are assigned to Headquarters Joint Operations Command (HQJOC) for that purpose. Since late 2008, HQJOC has been housed at a purpose-built facility near Bungendore in rural NSW and is staffed by around 750 personnel.

A more detailed outline of ADF command and HQJOC appears in Chapter 2.6 of this brief under Program 1.10.

Figure 1.2.3: ADF command structure



1.3 National Security Spending

The events of 9/11 prompted the recognition that no single agency has the capacity, or range of capabilities, necessary to ensure our security. The threat of terrorism within Australia, and to Australians abroad, has forced a whole-of-government approach to national security at the federal level. Even beyond the threat of terrorism, it is increasingly recognised that our national security interests are best served by a coordinated approach that uses all the levers available to government.

It's beyond the scope of this Defence Budget Brief to analyse and explain the budgets of all the agencies that contribute to national security. Instead, we'll content ourselves with a broad-brush description of how much is spent in key agencies. If nothing else, it provides a useful yardstick against which we can measure what's spent on defence. Unfortunately, because of the difficulty in finding data, our discussion excludes spending at the state and local levels.

In late 2008 the government foreshadowed the introduction of a 'national security budget'. Nothing appeared in the 2009-10 Budget and the closest that last year's budget came to it was a graph in the Budget Overview of Defence, non-Defence and Defence Operational spending. This reflects the high-level outcome of the government's coordinated national security budget process. A similar graph appeared again this year. Given the absence of any further detail, we have updated our usual assessment of national security spending.

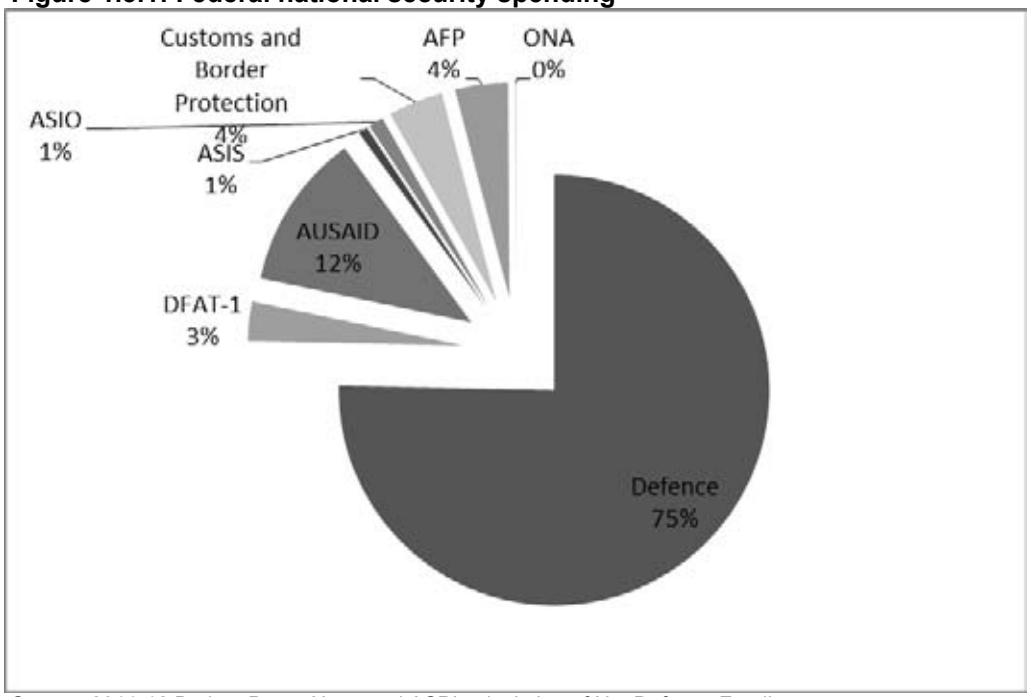
A number of federal agencies can make a credible claim to delivering some part of our national security. In selecting agencies, we have taken a liberal view of what constitutes national security, although we have excluded funding for outcomes within agencies that are clearly unrelated. Here's our list in alphabetical order, which cannot claim to be exhaustive:

- Australian Agency for International Development (AusAID)
- Australian Federal Police (AFP)
- Australian Security Intelligence Organisation (ASIO)
- Australian Secret Intelligence Service (ASIS)
- Department of Defence (DOD)
- Department of Foreign Affairs and Trade (Outcome 1: *Australia's national interests protected and advanced through contributions to international security, national economic and trade performance and global co-operation*.) (DFAT-1)
- Office of National Assessments (ONA).

Clearly, some of the activities of the listed agencies (even with the restriction to specific outcomes) go beyond national security. Conversely, other agencies that have been left out, like the Australian Customs and Border Protection Service, make a significant contribution to national security within their broader range of responsibilities. Such is the challenge of dealing with the aggregated data available in

the budget papers. Figure 1.3.1 compares the appropriations allocated to each of the aforementioned agencies in 2011-12.

Figure 1.3.1: Federal national security spending



Source: 2011-12 Budget Paper No. 4 and ASPI calculation of Net Defence Funding

At the risk of stating the obvious, Defence dwarfs all other federal areas of spending that contribute in some way to national security. This is despite the fact that many agencies (in particular, ASIS, ASIO and ONA) have received large boosts to their funding post-9/11, as Table 1.3.1 below shows.

Because changes in outputs and the presentation of budget figures make it difficult to extract precisely comparable figures from year to year, the numbers should be used with caution—though the broad trends are clear. Note also that the calculated growth is nominal rather than real.

Table 1.3.1: Federal national security appropriations 2001-02 to 2011-12

	2001-02 $ m	2002-03 $ m	2003-04 $ m	2004-05 $ m	2005-06 $ m	2006-07 $ m	2007-08 $ m	2008-09 $m	2009-10 $m	2010-11 $m	2011-12 $m	Nominal 10-year increase
Defence	13,191	14,216	15,439	16,224	17,523	19,142	19,976	22,888	25,532	24,752	26,535	101%
ODA	1,755	1,831	1,973	2,198	2,698	3,018	3,174	3,800	3,821	4,504	4,123	135%
AFP	523	391	609	777	968	885	1,310	1,385	1,486	1,425	1,397	167%
DFAT-1	660	701	709	774	717	740	822	843.4	1,187	1,060	1,039	57%
ASIO	69	90	98	161	187	341	450	429	427	414	394	471%
ASIS	54	59	80	89	100	131	162	217	248	250	246	355%
ONA	7	8	11	18	28	28	35	38	27	38	35	400%

Source: 2002-03 to 2011-12 Budget Paper No. 4 and ASPI calculation of Net Defence Funding

1.4 Measuring Defence Spending

The amount a country spends on defence is a direct measure of its commitment to protect itself. Accordingly, a lot of attention is placed on comparing levels of defence spending between countries and on tracking the rates at which those levels are increasing or decreasing. For example, here in Australia a lot of attention has been placed on the promised 3% real growth in the Defence budget in recent years. It is important, therefore, that reporting of defence spending captures what's actually going on.

Table 1.5.1 sets out the presentation in the 2011-12 PBS [Table 4, p.22] excluding the administered appropriations. (We ignore the administered appropriations for superannuation and housing because they are not controlled by Defence and are appropriated through the organisation for convenience.) The bottom line is *Total Defence Funding* which, in the past, has been presented in the PBS as 'the most common way of presenting the Defence budget' [2008-09 PBS, p.119].

Table 1.4.1 Total Defence funding FY 2011-12

	2011-12 $'000
Departmental	
1. Output Appropriation	22,640,794
2. Equity Injection	2,909,317
3. Prior Year Appropriation	8,000
4. Current year's appropriation (1+2+3)	**25,558,111**
5. Drawdown of appropriations carried forward	6,389
6 Other appropriation receivable movements	
7. Returns to Official Public Account (OPA)	-58,026
8 Funding to/from OPA	-51,637
9. Funding from Government (4+8)	**25,506,474**
9. Capital Receipts	117,827
10. Own-source Revenue	935,515
11. Funding from other sources (9+10)	1,053,342
12. Total Defence Funding (9+11)	**26,559,816**

Source: 2011-12 PBS

The easiest way to explore what a better approach might be is to examine each of the elements appearing in Table 1.4.1.

Current year's appropriations: This is the least ambiguous part of the problem. Each year the government formally appropriates money to Defence. The breakdown of the appropriation in terms of outputs and equity is an artefact of accrual accounting that need not concern us. What matters is that this is the quantum of cold hard cash that the government plans to make available to Defence for the financial year. As such, any credible measure of Defence funding must include this money.

Drawdown of appropriations carried forward: Following several years where Defence substantially underspent its budget, an Appropriation Receivable account was established to keep track of funds returned to government so that they might be drawn on in future years. Shifts to this account represent either the expenditure of additional public funds by Defence or the return of unspent funds. To properly track the funding employed by Defence, it makes good sense to take account of increases and decreases to the Appropriation Receivable account. However, if this is accepted, it follows that changes to Defence's cash holding must also be accounted for (since that's where the money in the appropriation receivable came from originally).

Capital Receipts: As custodian of more than $50 billion of public assets including land, buildings and military equipment, Defence inevitably receives cash from the disposal of items that are no longer needed. Some of this money is returned to government via a Return to the OPA. The remainder is retained by Defence and is called Net Capital Receipts. Given that Net Capital Receipts are generated from the sales of public assets, it is correct to count this income as part of Defence funding.

Own-source Revenues: Defence receives revenue from a number of sources. These include the supply of goods and services to third parties such as Defence personnel, who pay a share of the cost of their food and lodging provided by Defence, and foreign governments that purchase items like fuel. It makes little sense to include this as part of Defence funding. While it is perhaps reasonable to include revenue raised by using public assets (like Defence accommodation), the vast bulk of Own-source Revenue reflects Defence acting as an intermediary that transfers goods between 3rd party providers and 3rd party customers.

For example, the sale of fuel to a foreign government or rations to personnel delivers no revenue to Defence that is not at least equal to the cost of doing so. Or to put it another way, no one could seriously contend that Defence funding has risen by $50 million simply because, for example, an extra $50 million of fuel was purchased and sold on to the United States.

Own-source Revenues also includes transfers from the Defence Materiel Organisation (DMO) to Defence that cancel payments from Defence to DMO. The worst part is that these funds then get counted *twice* in the calculation of Total Defence Funding. It's hard to put an exact figure on it, but Defence's Own-source Revenues jumped by about $200 million the year that DMO became a prescribed agency, and DMO will pay Defence $440 million in 2011-12 [PBS page 151]. If there was ever any doubt that Own-source Revenues should be excluded from what's counted as Defence spending, this should settle the matter. Figure 1.4.1 is our best attempt to depict the situation graphically, though some simplification has been necessary.

Even if the double-shuffle payments to DMO was the only complication, that would be enough to reject *Total Defence Funding* as a credible measure of the Defence budget. But there is more. *Total Defence Funding* also includes payments to DMO that have in the past remained unspent. Indeed, over a four year period last decade, more than $927 million accumulated in the DMO Special Account, including $414 million from 2007-08. In some years, the Special Account is drawn down while in others it grows. There are a number of transactions that cause these movements including payments for previous years' work delivered. Table 1.4.2 is our best

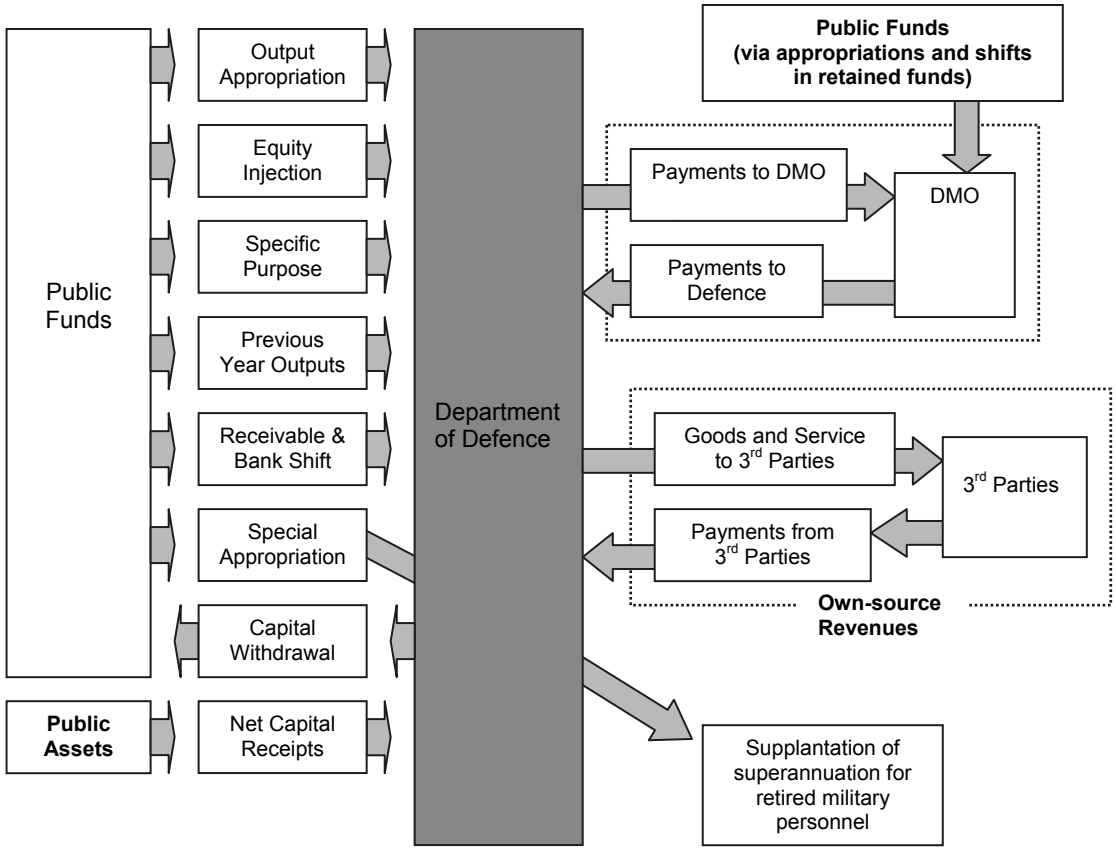
reckoning of how much has been left unspent or withdrawn from the special account in recent years—unfortunately the figures are subject to revision from document to document. As can be seen, the amounts are substantial. Last year, an additional $278 million accumulated in the DMO Special Account. More interestingly, in 2010-11 a further $159 million of funds accumulated—presumably above and beyond the disclosed hand back of money to the government.

Table 1.4.2: Shifts in the DMO Special Account (million $)

	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15
Closing balance of DMO Special Account	167	543	956	223	502	661	671	?	?	?
Amount left unspent (+ve) or amount drawn down (-ve)	167	377	413	-732	278	159	10	?	?	?

Source: 2011-12 PBS and various DAR

Figure 1.4.1: Defence Cash and Resource Flows



From a strict accounting perspective, no rules have been broken. Defence reports its funding accurately, and DMO reports its cash flow properly. Yet there is something surreal about failing to reconcile the net impact of the two things to show what's actually going on, especially given the high prominence of Defence funding in recent years.

So what is the 'Defence budget'?
While there is an accounting distinction between Defence and DMO, any sensible calculation of the 'Defence budget' must reflect the total impost on the taxpayer in delivering defence capability. This is easily achieved by adding DMO funding to the calculation and ignoring the transfer back and forth of money in between. Once again, the PBS contains a consolidation of the Defence and DMO budgets but it is not especially illuminating.

In light of the foregoing discussion, it seems sensible to include Funding from Government, Net Capital Receipts (= Capital Receipts – Return to OPA), Net Bank Balance Shifts, Appropriation Receivable and Special Account Shifts, but to exclude Own-source Revenue. And then to do the same for DMO and then add the results together, safe in the knowledge that the accounting transfers between the two entities have been excluded, Table 1.4.3. The addition of DMO appropriations is especially important because under new arrangements, DMO directly receives around $930 million that used to be provided by Defence.

Table 1.4.3: Total Defence resourcing FY 2011-12

	Total Defence Funding	ASPI Net Defence Spending
Departmental		
1. Output Appropriation	22,640,794	22,640,794
2. Equity Injection	2,909,317	2,909,317
3. Prior Year Appropriation	8,000	8,000
4. Current year's appropriation	**25,558,111**	**25,558,111**
5. Drawdown of appropriations carried forward	6,389	6,389
6 Other appropriation receivable movements		
7. Returns to OPA	-58,026	-58,026
8. Funding from Government	**25,506,474**	**25,506,474**
7. Capital Receipts	117,827	117,827
8. Own-source Revenue	935,515	
9. Funding from other sources	**1,053,342**	**117,827**
10. DMO Appropriation		929,201
11. DMO drawdown of Special Account		-10,301
12. Total Defence Funding	**26,559,816**	
13. ASPI Net Defence Funding		**26,543,201**

The difference is not large. Our calculation of Net Defence Funding yields a figure only 0.06% below that of Total Defence Funding. The difference would be larger if not for the almost complete (but entirely coincidental) cancellation of Own-source Revenues and direct appropriation to DMO. Nonetheless, we believe that *ASPI Net Defence Funding* is a better measure of the 'Defence budget' than *Total Defence Funding.*

CHAPTER 2 – DEFENCE BUDGET 2011-12 PBS EXPLAINED

The 240 pages of the 2011–12 Defence Portfolio Budget Statements (PBS) set out the government's plan for the expenditure of around $26.5 billion by Defence in the coming financial year.

This guide explains and where possible analyses the information in the PBS. In doing so, we skim over those parts of the PBS that are relatively clear, and focus on those areas where explanation might be useful.

Some of the material that follows is unavoidably technical due to the disciplines and complexities of accounting. However, it is not necessary to read this chapter as a whole, or in sequence, to gain insight. Every attempt has been made to enable the reader to jump in and look at those items of most interest.

This Brief does not cover in any detail the funds administered by Defence on behalf of the government for superannuation and housing support services for current and retired Defence personnel.

Most parts of the guide are best read with the PBS at hand. Copies can be downloaded from the web at <http://www.defence.gov.au/budget/>.

2.1: Strategic direction [PBS Section 1.1]

The overview chapter of the PBS begins with a brief discussion of the strategic context. Not surprisingly, the focus this year is on delivering the 2009 Defence White Paper and attendant Strategic Reform Program. Changes to the organisational structure of Defence are then surveyed (see Chapter 1 of this Brief for an explanation) along with a survey of Defence's portfolio bodies.

2.2: Resourcing [PBS Section 1.2 & 1.3]

The 'rubber hits the road' in Sections 1.2 and 1.3 of the PBS, in terms of allocating money to get things done. It contains the resource statements, new budget measures and the funding bottom line.

How much money will Defence get?

On page 22 of the PBS, we get to the heart of the issue. Table 4 gives three key figures for the Defence budget:

- **Funding from Government,** being those funds formally *appropriated* to Defence by the government for departmental purposes along with shifts in appropriations receivable (unspent money from previous years). In 2011-12 this amounts to $25,506,474,000.

- **Total Defence Funding,** being those funds actually *available* to Defence including appropriations and revenue from other sources. In 2011-12 this amounts to $26,559,816,000.

- **Total Defence Resourcing,** being Total Defence Funding plus those funds appropriated administratively through Defence for superannuation and defence housing subsidies. In 2011-12 this amounts to $30,561,422,000.

Of these three figures, *Total Defence Funding* is the one most usually quoted as the Defence budget. It represents the funds expended by Defence to deliver the departmental outcomes and maintain the ongoing program of investment in new equipment and facilities. Note, *Total Defence Funding* does not include administered funds for superannuation and defence housing subsidies.

However, as explained in the last chapter, *Total Defence Funding* is inflated by a churning of money (including in past years between DMO and Defence) that delivers no military capability or outcome. What's more, Total Departmental Funding ignores the money appropriated directly to the DMO and the money that in recent years has been accumulating unspent in the DMO Special Account. We believe that the *ASPI Net Defence Spending* figure accounts for these issues properly and therefore gives a more accurate picture of how much is being spent on delivering defence capability and outcomes. Henceforth, we will only present the *ASPI Net Defence Funding* figure.

How much money will Defence receive?

Table 2.2.1 displays Defence funding for the past nine, and next four, financial years. Also shown are both the nominal and real year-to-year percentage growth rates.

Table 2.2.1: ASPI Net Defence Funding – real (2011-12$) and nominal (nom)

	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15
Funds (nom)	13,191	14,216	15,439	16,224	17,547	19,140	19,954	22,884	24,987	24,845	26,535	24,883	26,651	27,513
Growth (nom)	7.1%	7.8%	8.6%	5.1%	8.2%	9.1%	4.3%	14.7%	9.2%	-0.6%	6.8%	-6.2%	7.1%	3.2%
Funds (real)	19,089	20,001	20,821	21,084	21,756	22,742	22,705	24,643	26,252	25,466	26,535	24,276	25,367	25,548
Growth (real)	4.7%	4.8%	4.1%	1.3%	3.2%	4.5%	-0.2%	8.5%	6.5%	-3.0%	4.2%	-8.5%	4.5%	0.7%

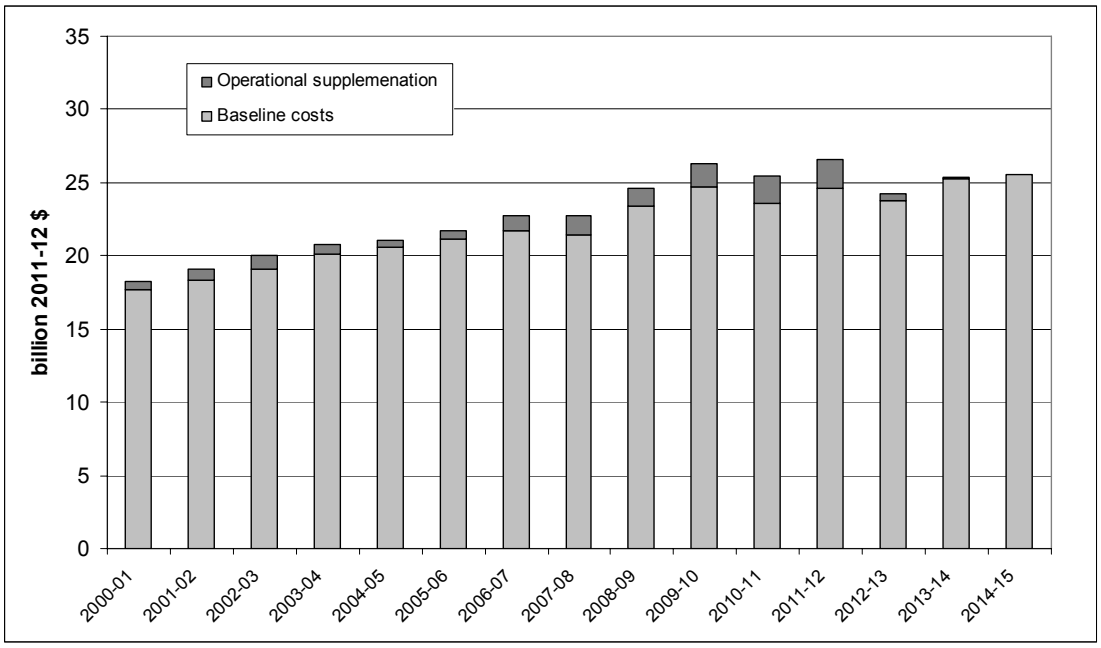
Source: 2011-12 PBS, 2010-11 PAES and earlier Defence Annual Reports (DAR).

When calculating the real growth rate, the nominal dollar values of the individual years have been converted to a single base year using the deflator used to maintain Defence buying power in real terms. From 2001-02 until 2009-10 this was the implicit Non-Farm GDP Deflator (NFGDPD) and from 2009-10 onwards it is fixed at 2.5% in accord with the funding model for the 2009 Defence White Paper.

The average *arithmetic* annual rate of real growth in the budget since 2000-01 (the last year prior to the 2000 White Paper) to 2011-12 is 3.5%. Over the same period, the effective *compounding* annual rate of real growth is also 3.5%. Thus, by either measure, it looks like the 3% real growth funding trajectory set back in 2000 has been more than achieved.

The future does not look so bright. For the period covered by the new White Paper commencing in 2009-10, the six-year *arithmetic* annual rate of real growth in the budget will be 0.7% and the effective *compounding* annual rate of real growth will be slightly less at 0.6%. Figure 2.2.1 shows real defence funding over the past decade and as now planned. A fuller discussion of defence funding appears in Chapter 3 of this Brief.

Figure 2.2.1: Real Net Defence Funding – 2000 to 2014



Source: 2011-12 PBS, 2010-11 PAES and earlier DAR.

What is the Defence share of GDP?

Table 2.2.2 gives Net Defence Funding as a percentage of GDP for recent and future years. In 2011-12, the share of GDP will be 1.80% compared with 1.78% in 2010-11 because the expansion of the economy largely offsets the increase in spending. Over the following three years, sluggish real spending and a rising economy will push the share of GDP down again. Note that, current and recent spending is boosted by high levels of operational supplementation that are not reflected in the latter years of the forward estimates. Note also that, new estimates of historical GDP marginally alter historical GDP percentages compared with that reported in previous Budget Briefs.

Table 2.2.2: ASPI Net Defence Funding as a percentage of GDP

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15
% GDP	1.74	1.74	1.77	1.79	1.75	1.75	1.75	1.68	1.82	1.95	1.79	1.80	1.60	1.62	1.59

Source: 2011-12 Budget Overview, 2011-12 PBS and earlier DAR

What is the Defence share of Commonwealth payments?

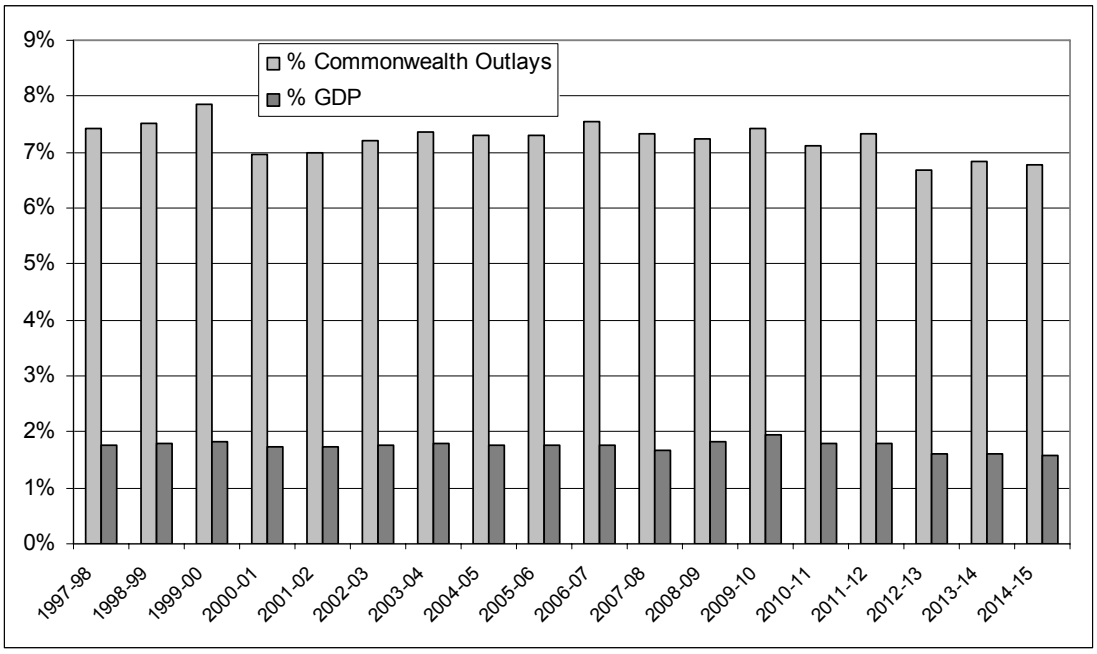
Defence spending as a percentage of total Commonwealth payments is shown in Table 2.2.3. On current plans, Defence's share of payments will rise slightly before falling back over the forward estimates period. Figure 2.2.2 graphs the percentage GDP and share of Commonwealth payments from 1997 to 2014.

Table 2.2.3: ASPI Net Defence Funding as a percentage of Commonwealth payments

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15
%	6.96	6.99	7.21	7.36	7.29	7.31	7.56	7.35	7.24	7.42	7.10	7.33	6.69	6.85	6.77

Source: 2011-12 Budget Overview, 2011-12 PBS and earlier DAR

Figure 2.2.2: Net Defence Funding as a Percentage of payments and GDP



Source: 2011-12 Budget Overview, 2011-12 PBS and earlier DAR

Changes since the last budget

Since the last budget, several measures and adjustments have been undertaken that provide context for this year's budget. Table 2.2.4 shows the key items from the 2010-11 Portfolio Additional Estimates Statement (PAES) [Table 3, p.17].

Table 2.2.4: Key measures and adjustment from the 2010-11 PAES (million $)

	10-11	11-12	12-13	13-14	4 year total	10 year total
Budget measures						
Australia's engagement in Afghanistan	108.5	-	-	-	108.5	108.5
Amenities internet access	3.6	5.8	5.8	2.3	17.4	17.4
Adjustments						
Cyber security	-0.1	-0.2	-	-	-0.3	-0.3
Property disposals	5.7	-12.6	21.2	-54.7	-40.4	-40.4
DMO appropriation transfers	52.3	18.6	0.4	0.4	71.7	74.4
Foreign exchange movements	-71.0	-108.5	-66.1	-59.9	-305.6	-802.5
TOTAL	**99.0**	**-96.9**	**-38.8**	**-111.9**	**-148.6**	**-642.8**

Source: 2010-11 PAES.

Australia's engagement in Afghanistan

An additional $108.5 million was provided for 'the changed role of the ADF and the transition from a Dutch-led to a United States-led Combined Team Uruzgan Province', including strategic lift support for Singaporean forces and new detainee management arrangements.

Amenities internet access – all operations

Funding of $17.4 million over four years was provided to standardise the delivery of internet access for ADF personnel deployed on operations.

Cyber security

An adjustment of -$0.3 million was made to transfer Defence's contribution to prime Minister and Cabinet (PM&C) for the establishment of a Cyber Policy Co-ordination Group.

Property disposals

These adjustments relate to the retention and payment to government of revenues from property disposals.

DMO appropriation transfers

DMO will return $71.7 million over four years due to forecast underspends in civilian and military employee expenses.

Foreign Exchange movements

Defence is funded on a no-win/no-loss basis for foreign exchange movements. Depending on how the Australian dollar moves relative to currencies that Defence plans to make purchases in, adjustments are made to maintain the buying power of the Defence budget. As a result of an appreciation in the value of the Australian dollar in 2010-11, Defence handed back $71 million in 2010-11, $305.6 million over the budget and forward estimates, and $802.5 million over the decade.

2.3: Funding from Government [PBS Section 1.3]

The 2011-12 Budget Measures and Adjustments [PBS p. 27 – 31]

Changes made in the 2011-12 Defence budget are set out in the PBS. The changes fall into three categories: budget measures, savings measures and budget adjustments. The distinction between the three is variable, with identical items classified differently from one year to the next. There are six budget measures, four savings measures and five adjustments in this year's PBS. These are detailed on pages 28 to 31 of the PBS. A further two measures are listed as having been agreed since the PAES. Curiously, the costs for these measures are only disclosed in the Treasury budget papers. For ease of reference, the individual measures and adjustments have been detailed in Table 2.2.5.

Table 2.2.5: 2011-12 Budget Measures and Adjustments (million $)

	2011-12	2012-13	2013-14	2014-15	4 year total	10 year total
Funded Measures						
Middle East Area of Operations - continuation	926.1	115.4	93.9	-	1,135.4	1,135.4
East Timor – continuation	133.4	2.2	0.6	-	136.2	136.2
Solomon Islands – continuation	41.8	1.2	0.1	-	43.1	43.1
Security at Baghdad Embassy	-1.1	-1.9	-	-	-3.1	-3.1
subtotal	**1,100.2**	**116.9**	**94.5**	**-**	**1,311.6**	**1,311.6**
Savings Measures						
Increased efficiencies	-226.6	-320.7	-318.7	-319.1	-1,185.0	-2,947.7
Efficiency dividend (temporary increase)	-15.3	-30.4	-39.6	-49.6	-134.9	-406.2
C-130J purchase cancellation	-2.4	-3.8	-16.9	-88.1	-111.3	-520.1
Capital investment reprogramming	69.8	-158.9	-323.8	-868.0	-1,280.8	1,108.1
subtotal	**-174.5**	**-513.7**	**-699.0**	**-1,324.8**	**-2712.0**	**-2765.8**
Adjustments						
United States Studies Centre	-0.3	-0.3	-0.3		-1.0	-1.0
Qld floods commission of inquiry	-0.1	-	-	-	-0.1	-0.1
Overseas property office	-2.0	-2.0	-2.0	-2.0	-8.0	-19.9
Foreign exchange	-210.3	-194.2	-177.9	-168.6	-751.0	-2,403.0
Property disposal adjustment	27.7	-91.2	148.8	-	85.2	85.2
subtotal	**-185.0**	**-287.8**	**-31.5**	**-170.6**	**-674.9**	**-2,338.9**
Variation to Defence funding	**740.7**	**-684.7**	**-636.0**	**-1,495.4**	**-2,075.3**	**-3,793.1**
Absorbed measures						
Security at Baghdad Embassy	2.1	1.9	-	-	4.0	
Coastal surveillance	9.8				9.8	
Noise management at RAAF Williamtown	?					
C-17 Globemaster III aircraft purchase*					251.9	332.9
HMS *Largs Bay* purchase*					276.8	276.8
Total absorbed measures	**11.9**	**1.9**	**-**	**-**		

Source: 2011-12 PBS and Budget Paper #2. Numbers may not add up due to rounding.
*4-year and 10-year figures only approximate

The budget initiatives in detail

Although the PBS does a good job of explaining the measures, further information is sometimes available in Treasury's Budget Paper Number 2. In what follows, the key points are reproduced—often verbatim—from these two sources. See Chapter 6 of this Brief for more on the cost and composition of ADF deployments.

Middle East Area of Operations — continuation and enhancement of Australia's military contribution
The Government has provided $1,135 million over the forward estimates for the net additional cost of extending the ADF's contribution to the international coalition against terrorism operation in the Middle East (principally Afghanistan) to 30 June 2012.

East Timor — continuation of Australia's commitment to helping to maintain security and stability
The government will provide $136 million over three years for the net additional cost of extending Australia's military contribution to maintaining stability in East Timor until June 2012.

Solomon Islands — continued Australian Defence Force assistance to the Regional Assistance Mission to Solomon Islands (RAMSI)
The government will provide $43 million over three years for the net additional cost of extending Australia's military contribution to the Regional Assistance Mission to Solomon Islands (RAMSI) until June 2012.

Coastal Surveillance
Defence will absorb the net additional cost of $9.8 million of extending coastal surveillance operations until 30 June 2012.

RAAF Base Williamtown – improving aircraft noise management
This initiative will develop options to address noise issues in the vicinity of RAAF Base Williamtown including the development and release of a new Australian Noise Exposure Forecast for the area surrounding RAAF Base Williamtown in 2025. Defence will absorb the cost of this budget measure.

Baghdad Embassy — civilian security arrangements — final transition
The ADF's security role at the Baghdad embassy will transition to a fully contracted security arrangement administered by the Department of Foreign Affairs and Trade. Defence will absorb the net additional cost of the operation and return to Government previous funding of $3.1 million provided.

Increased efficiencies
Savings of $1,185 million over the forward estimates, and $2,948 million over ten years will come from additional efficiencies in Defence’s corporate and support functions, including through greater reductions in duplication and increased use of shared services. Unlike earlier cost reductions from the Strategic Reform Program, the savings will be returned to the government.

Efficiency dividend - temporary increase in the rate
The Government extended the efficiency dividend for Defence with an increase to the efficiency dividend from 1% to 1.5% in 2011-12 and 2012-13 and 1.25% in 2013-14 and 2014-15. This measure will result in savings of $135 million over four years and $406 million over the decade. Despite the title, there does not appear to be anything temporary about the increase. Again, unlike earlier cost reductions from the Strategic Reform Program, the savings will be returned to the government.

C-130J Hercules - cancellation of two additional aircraft
The previously planned acquisition of two additional C-130J Hercules aircraft has

been cancelled in favour of an earlier purchase on an additional C-17 *Globemaster* aircraft. But while Defence will absorb the cost of the new C-17, they have to return the funding for the two C-130J. This will deliver $111.3 million to the government over the forward estimates and $520 million over the decade. It is unclear why so much money is being harvested. The 2012 USAF budget papers give the weapons system cost of a new C-130 J as US$73 million; doubling this for two aircraft and adding 30% for spares and procurement overheads still comes to less than $190 million. However, Defence advises that infrastructure and NPOC associated with the C-130J was also returned to the government.

C-17 Globemaster III Fleet — acquisition of additional aircraft
An additional C-17 *Globemaster* aircraft and associated equipment will be purchased at a cost of $251.9 million over four years from 2010-11. The aircraft is expected to be received and operational in 2011. A further $81million over the period to 2036 will be spent on the net personnel and operating costs of the aircraft. The cost of this measure will be met by Defence.

Royal Fleet Auxiliary Largs Bay — acquisition
Following the effective collapse of the ADF's amphibious lift capability in February 2011, $104 million will be spent in 2010-11 on the acquisition of a British Bay Class amphibious ship, the Royal Fleet Auxiliary (RFA) *Largs Bay*. Following a successful bid of UK£65 million, and pending sea trials, the acquisition is expected to be finalised by the end of 2011 with the ship operational in early 2012. A further $73 million over three years will be spent commencing 2010-11 for fit-out costs and $99 million over six years commencing 2011-12 for net personnel and operating costs.

This interim amphibious capability will replace the decommissioned HMAS *Manoora* and will be used until the introduction into service of two Canberra class Landing Helicopter Docks (LHDs). The cost of this measure will be met by Defence.

Reprogramming of funding to better align with Defence's requirements
Capital investment has been reprogrammed from the next four years to beyond 2014-15. This will result in a reduction in Defence funding of $1,281 million over four years and an increase of $1,108 million over ten (presumably reflecting the reprogramming of $1.1 billion from 2010-11). See Chapter 3 for further analysis.

Funding adjustments:

United States Studies Centre - contribution
Transfer of $100,000 to Prime Minister and Cabinet for Defence's contribution to the establishment of a USA Studies Centre.

Natural Disaster Recovery and Rebuilding – Commission of Inquiry into Qld Floods
Transfer to Attorney General's Department for Defence's contribution ($100,000) to the Commission of Inquiry into the Queensland Floods.

Overseas Property Office
Following a review of the Overseas Property Office, Defence will return $8.0 million over the forward estimates.

Foreign exchange
In light of foreign exchange movements, Defence will hand back $751 million over

four years and $2,403 million over ten years. These adjustments are designed to maintain the buying power of the Defence budget.

Property disposal adjustment
This adjustment accounts for altered revenues from the sale of properties which Defence retains.

So what happened?

The measures in this budget need to be seen in the context of Defence's $1.5 billion underspend in 2010-11 which included $1.1 billion in investment funds and $400 million of recurrent spending. Notwithstanding claims about reprograming the investment program 'to better align it with Defence's strategic requirements' and savings from 'additional efficiencies in corporate and support functions', all signs are that the government simply took away money because Defence did not need it. Given the circumstances, it's hard to see what other alternative there was.

It's noteworthy the hand back of money this year is *in addition* to the accumulation of a further $159 million in the DMO Special Account, following on from the additional $278 million that accumulated in 2009-10. Unfortunately, the complexities of Defence's appropriation receivable have made it impossible to determine the extent, if any, of a hand back of funds by Defence in 2009-10.

It is noteworthy that the investment program has been handled very differently from recurrent expenditure. A total of $2.4 billion of previously planned investment has been deferred to beyond 2014-15, including the $1.1 billion hand back in 2010-11. But this money will be available when (and if) it is needed in the future. In contrast, $3.9 billion worth of so-called 'efficiencies' and 'savings' have been returned to the Treasury with no suggestion that Defence can call on the funds at a later date.

The steps taken in this budget have important consequences for both the delivery of *Force 2030* and the credibility of the Strategic Reform Program. These issues are explored in Chapters 3 and 4 of this brief.

The remainder of Section 1 of the PBS contains a range of information including: ***Defence Resource Statement*** [PBS p. 23] which lists the formal appropriation of funds to defence. ***Purchase-Provider Arrangements*** [PBS p. 26] which lists the itemised payments to DMO for goods and services rendered. ***Operations Summary*** [PBS p. 32-33] which provides some detail of the funding and composition of ADF deployments. ***Capital Investment Program*** and ***Retained Capital Receipts*** [PBS p. 34-35] which we explore more fully in Chapter 2.4 of this Brief. ***People*** [PBS p. 36–41] which we explore more fully in Chapter 2.5 of this brief.

2.4: Capital Investment Program [PBS Section 1.4]

Information on the Capital Budget is now spread across several areas of the PBS. The Capital Budget represents Defence's plans for capital investment in new equipment, upgrades, facilities and other non-military capital items. It's formally described in accounting terms in the Capital Budget Statement in Table 66 on page 123 of the PBS, although that is not very revealing.

Capital Investment Program [PBS p.30]

The Capital Investment Program is detailed in Table 14 page 34, which we have reproduced in part in Table 2.4.1. Unfortunately, the projected result for 2010-11 has not been included in this year's PBS so we have been forced to use the revised estimate from the 2010-11 PAES (which we know has been overtaken by events).

Table 2.4.1: The Capital Investment Program (million $)

	05-06 actual	06-07 actual	07-08 actual	08-09 actual	09-10 actual	10-11* revised	11-12 budget	12-13 forward	13-14 forward	14-15 forward
Unapproved Major Capital Investment (DCP)	-	-	-	-	-	124	719	1,304	2,953	3,826
Approved Major Capital Investment	3,888	4,019	4,030	3,943	5,150	5,142	4,410	2,940	2,407	2,585
Subtotal	**3,888**	**4,019**	**4,030**	**3,943**	**5,150**	**5,266**	**5,119**	**4,244**	**5,360**	**6,411**
Capital Facilities Approved & Unapproved	430	653	570	963	1,504	1,320	1,180	1,164	885	603
Other Capital	722	925	829	742	626	1,614	740	788	924	378
Total Capital Investment Program	**5,041**	**5,598**	**5,429**	**5,648**	**7,109**	**8,200**	**7,049**	**6,197**	**7,170**	**7,393**

Source: 2011-12 PBS, 2010-11 PAES and various DAR. *2010-11 does not include $1.1 billion hand back.

There are four components to the Capital Investment Program:

Unapproved Major Capital Investment Program or Defence Capability Plan (DCP): This represents Major Capital Investment projects that have not yet received second pass approval from government. Major Capital Investment projects are generally of more than $20 million value and predominantly involve the purchase of military equipment, (previously called 'Pink Book' projects). The preparation of these projects for approval is the responsibility of the Chief of the Capability Development Group. Once approved, projects pass to the DMO for delivery.

Approved Major Capital Investment Program: Projects already approved by government and under way, previously called the 'White Book'. Once approved, projects generally pass to the DMO for delivery.

Capital Facilities: Approved and Unapproved Capital Facilities Projects, including everything from new barracks to upgrades of existing facilities. These projects are the responsibility of the Infrastructure Division in the Defence Support Group.

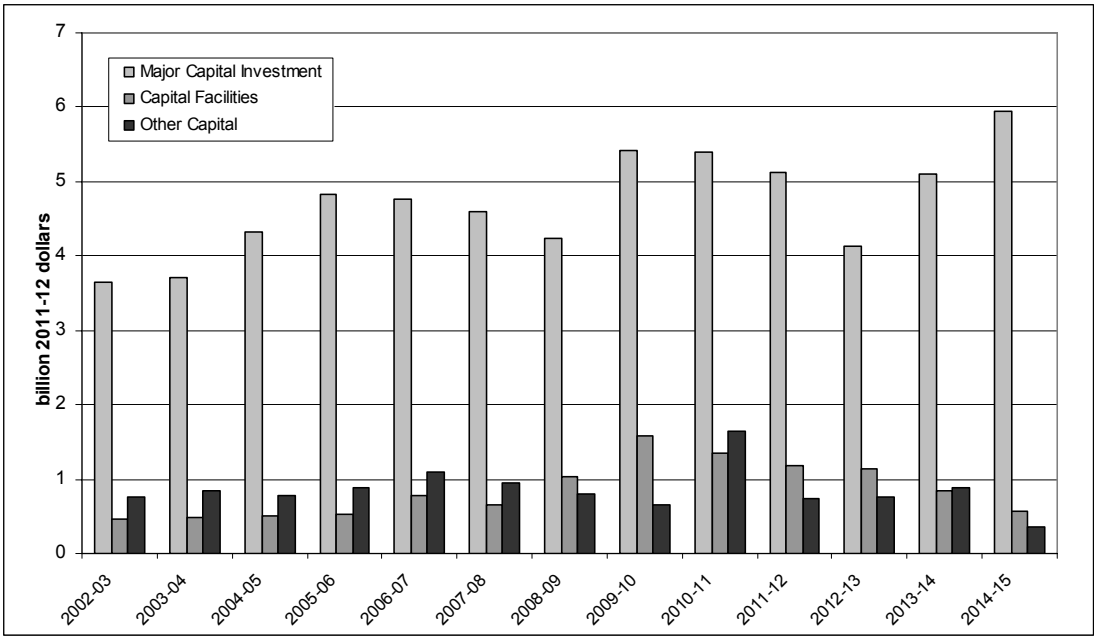
Other Capital: including Minor Capital Investment (projects costing less than $20 million), repairable items, non-capital facilities, plant and equipment, and software and intangibles. In the 2010-11 revised estimate, this was also used as a holding pen for unspent funds.

What are the trends in the Capital Investment Program?

Recent actual and projected real spending in the Capital Investment Program is shown in Figure 2.4.1. Note that the figures for 2010-11 do not take into account the $1.1 billion hand back announced in the budget, nor the unknown impact of shifts in

the DMO Special Account. The trend across the forward estimates is for an initial decrease (mainly due to the cuts made in the 2009-10 Budget) before a recovery post 2012-13. Capital Facilities and Other Capital investment will fall over the forward estimates.

Figure 2.4.1: Recent and planned trends in the Capital Investment Program



Source: 2011-12 PBS and 2010-11PAES and DAR. Figures for 2010-11 exclusive of the $1.1 billion hand back.

Operating Component of Capital Investment

Not all of the money in the Capital Investment Program actually represents capital investment. There's also an Operating Component of Capital Investment that includes those funds treated as expenses in the process of acquiring the capital equipment or facilities. This includes project office costs, studies, research and development, travel, professional service providers and other overheads.

The operating component of capital investment is not evenly spread across the three components of the capital program, nor is it constant in time (see Table 2.4.2). The mix of funding will continue to change reflecting project throughput and the individual circumstances of each project. The operating component of the Major Capital Investment Program has probably fallen in recent years due to the number of very large projects including the two massive Foreign Military Sale purchases from the United States; the F/A-18 *Super Hornets* and the C-17 *Globemaster* strategic transports. This year the operating component of the individual components was not disclosed.

Table 2.4.2: Percentage of operating component in Capital Investment Program

	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	13-14
Major Capital Investment	9.8%	13.6%	17.9%	13.9%	13.6%	14.7%	18.0%	8.0%	6.1%	-	-	-	-
Capital Facilities	0.0%	4.8%	14.8%	11.7%	11.5%	3.6%	10.6%	9.4%	6.3%	-	-	-	-
Other Capital	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-	-
Total Program										5.4%	7.2%	9.7%	11.5%

Source: 2011-12 PBS, and various PBS, PAES and DAR

Unapproved Major Capital Investment Program [PBS page 75]

The PBS used to contain a list of DCP projects planned for first and second pass approval in the forthcoming year, but this was discontinued in 2010-11. Instead, a list of projects 'in development' for first and second pass approval are provided [Tables 44 and 45, p. 90–92].

Approved Major Capital Investment Program [PBS page 155]

The approved Capital Investment Program is mainly, but not exclusively, the responsibility of DMO. As a result, most of the information on approved projects can be found in the DMO section of the PBS, including details of the top 30 projects. We examine the Capital Investment Program more closely in Chapter 2.7 of this Brief.

Facilities Projects [PBS pp.57–66]

The PBS lists 63 approved Capital Facilities projects at various locations. This includes 47 major projects (worth $15 million each or more) with a total value $4.9 billion, and 16 medium projects of between $25,000 and $15 million with a total value $58.7 million. In the 2011–12 Budget the government has foreshadowed 13 new major capital works projects for parliamentary consideration and 13 medium capital works projects. These are listed in Table 35 and Table 38 of the PBS respectively. Expenditure on facilities projects in 2011-12 is planned to be $1.2 billion compared with $1.3 billion in 2010-11.

Table 34 of the PBS lists the approved major facilities projects. The largest such projects are the Enhanced Land Force facilities at various locations ($2,251 million), Hardened and Networked Army Facilities at various locations ($597 million), RAAF Amberley Redevelopment ($442 million), the development of Heavy Airlift Capability facilities ($268 million), the redevelopment of RAAF Pearce ($142 million) and Multirole Helicopter facilities ($137 million) at various locations.

Table 36 on page 75 of the PBS lists 13 future possible private financing projects that are under development as part of the Single Leap initiative.

Other Capital Purchases

Other capital purchases include Minor Capital Investment, Repairable Items and Other Plant and Equipment. Defence plans to spend $740 million on other capital purchases in 2011-12.

Retained Capital Receipts [PBS page 35]

The Capital Budget is funded in part through the proceeds from sales of property, plant and equipment and other capital receipts (see Table 15 on Page 35 of the PBS). On a year by year basis some or all of this money is returned to the government through a capital withdrawal. This is taken into account in determining the appropriations to Defence. Table 2.4.3 shows recently planned and achieved assets sales (including both property and other assets) within the Defence Capital Budget.

Table 2.4.3: Proceeds from the sale of assets ($ million)

	Budgeted	Achieved	Shortfall
DRP to June 2000	–	77	–
2000–01	820	87	733
2001–02	1023	199	824
2002–03	700	632	68
2003–04	306	184	122
2004-05	231	143	88
2005-06	95	108	-13
2006-07	38	134	-96
2007-08	99	65	-34
2008-09	285	5	280
2009-10	287	61	226
2010-11	156	155	1
2011-12	118		
2012-13	155		
2013-14	86		
2014-15	94		

Source: DAR and 2011-12 PBS

2.5: People [PBS Section 1.5]

Overview [PBS p. 36]

The Overview of the PBS 'People' section outlines Defence's policy framework for personnel focusing on the December 2009 publication *People in Defence - Generating the Capability for the Future Force.* Mention is also made of a series of reviews commissioned by the government on;

- treatment of women in the ADF
- leadership pathways for women in the ADF and APS
- use of alcohol in the ADF
- the impact of social media on Defence
- personal conduct issues in the ADF.

Since 2000 there have been a range of initiatives to improve the management of personnel from a business and planning perspective, and to enhance the development, care, recruitment and retention of personnel. Many of these initiatives began in 2001-02, when $500 million was allocated over five years to deal with high priority personnel issues. Then, in 2006-07, $182 million was provided over four years for enhanced Reserve remuneration and $194 million was allocated to improve recruitment and retention.

Subsequently, in late 2006, the then-government allocated another $1 billion for recruitment and retention over ten years, and in the 2007 budget a further $2.1 billion was made available. The 2009 budget contained three personnel-related measures: retention of accommodation for members on deployment ($30.9 million over four years); an extension of the ADF family health care trial ($44.5 million over four years) and the boost to Navy's personnel numbers of 700 ($405 million over four years).

Now it appears as though the tide has turned. The last twenty-four months have seen military recruitment and retention exceed expectations and produce dramatic growth in full-time ADF numbers. Consistent with this, there were no new personnel-related measures in this year's budget and several planned personnel initiatives have been either abandoned or scaled back to generate savings under the Strategic Reform Program (see Chapter 4 of this Brief).

How big is the workforce?

According to the PBS, in 2011–12 Defence will be funded to maintain an average of around 59,053 full-time military personnel, 21,684 civilians (including 5,647 in DMO) and 22,350 Reservists. In addition, there will be 644 Professional Service Providers or 'contractors', including 51 in DMO. Over the next four years, military numbers are planned to oscillate around 59,000 before rising to 59,546 in 2014-15. Civilian personnel numbers are planned to rise by almost 1,000 year-on-year in 2011-12 and will then oscillate around 21,700 over the next three years.

Table 2.5.1: Workforce summary for Defence plus DMO (average funded strength)

	01-02 actual	02–03 actual	03–04 actual	04–05 actual	05–06 actual	06–07 actual	07–08 actual	08–09 actual	09–10 actual	10–11 proj.	11-12 bud.	12-13 est.	13-14 est.	14-15 est.
Navy	12,598	12,847	13,133	13,089	12,767	12,690	12,935	13,182	13,828	14,215	14,220	14,267	14,321	14,355
Army	25,012	25,587	25,446	25,356	25,241	25,525	26,611	27,833	29,339	30,235	30,617	30,571	30,640	31,076
Air Force	13,322	13,646	13,455	13,368	13,143	13,289	13,621	14,066	14,530	14,573	14,216	14,090	13,911	14,115
TOTAL	**50,932**	**52,080**	**52,034**	**51,813**	**51,151**	**51,504**	**53,167**	**55,081**	**57,697**	**59,023**	**59,053**	**58,928**	**58,872**	**59,546**
Active Reserve	18,868	19,620	20,488	19,275	19,464	19,562	20,340	20,277	21,248	20,350	20,750	21,100	21,450	21,450
High Ready	-	-	-	-	-	-	-	-	-	1,500	1,600	1,750	1,840	1,840
Total Reserve	**18,868**	**19,620**	**20,488**	**19,275**	**19,464**	**19,562**	**20,340**	**20,277**	**21,248**	**21,850**	**22,350**	**22,850**	**23,290**	**23,290**
Civilians														
Defence	16,819	18,385	18,303	13,390	13,577	14,516	15,087	14,489	14,532	15,146	16,001	16,114	15,972	15,611
DMO	-	-	-	4,363	4,502	4,951	5,304	5,552	5,526	5,510	5,647	5,744	5,874	6,096
Total Civilian	**16,819**	**18,385**	**18,303**	**17,753**	**18,079**	**19,467**	**20,391**	**20,041**	**20,058**	**20,656**	**21,648**	**21,858**	**21,846**	**21,707**
PSP														
Defence	-	2,311	1,880	1,913	1,277	810	620	1,008	700	651	593	488	450	447
DMO	-	-	-	-	374	298	181	176	120	24	51	48	48	48
Total PSP	-	2,311	1,880	1,913	1,651	1,099	801	1,184	820	675	644	536	498	495
PSP & Civilian	-	20,696	20,183	19,666	19,730	20,575	21,192	21,225	20,878	21,331	22,292	22,394	22,344	22,202

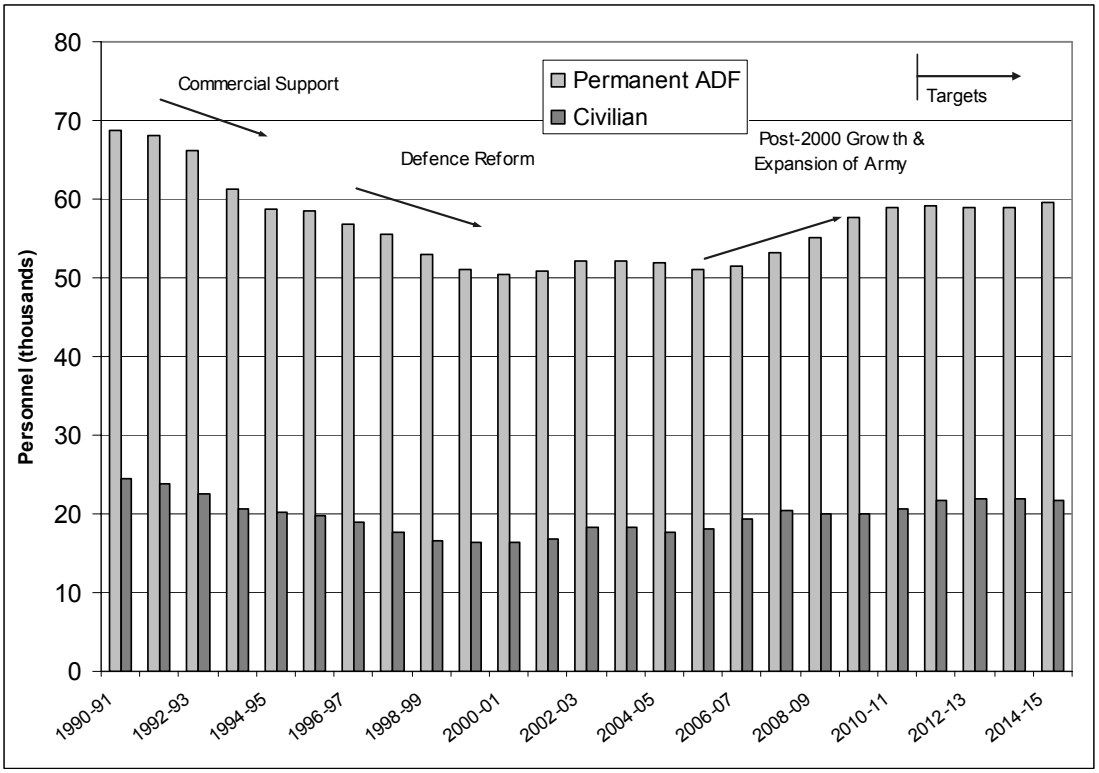
Source: DAR, 2011-12 PBS.

However, Defence has since advised ASPI that ADF numbers in the PBS for 2012-13 to 2014-15 are incorrect and that they should read 58,016, 58,568 and 58,852. These revised figures represent reductions of 912, 304 and 694 positions relative to the figures in the PBS. Defence further advises that the estimate of 59,053 for 2011-12 is 1,505 above the budgeted workforce of 57,548 but that 'budget coverage' for a further 704 Reservists on full-time operation duty is being sought to reduce the budgetary overachievement to 801. Similar 'coverage' for a 447 positions was provided during 2010-11.

How did we get to this point?

During the 1990s ADF numbers dropped from around 70,000 to 50,000 permanent personnel, as shown in Figure 2.5.1.

Figure 2.5.1 Historical and Planned Defence Workforce



Source: DAR, 2001-02 Defence Budget Brief and 2011-12 PBS

The bulk of these reductions were due to outsourcing under the Commercial Support and Defence Reform programs (although around 5,600 permanent ADF positions had already been transferred to the Reserve by the 1991 Force Structure Review). In fact, the initial goal of the Defence Reform Program (DRP) was to reduce the strength of the ADF to 43,500 but this was soon revised up to 50,000, thereby arresting the decline. This was done by re-directing DRP savings to buy-back the ADF positions, the goal being to redirect personnel from support areas to the combat force—though there is little evidence of this occurring.

The 2000 White Paper then set permanent ADF numbers on a growth path. Until 2003, the target was to build a force of 'around 54,000' permanent ADF personnel by 2010. However, the government accepted the recommendations of the 2003 Defence Capability Review, which saw some capabilities withdrawn from service in the next decade. As a result, the 2004-05 PBS [p.5] referred to 'continued growth of the ADF towards 53,000'. However, subsequent budgets added additional personnel for a range of initiatives including, most especially, the expansion of the Army.

Prior to the 2009 White Paper, the target strengths for the permanent ADF were 57,500 by 2011-12 and 'to more than 57,000 over the decade'. The 2009 Defence White Paper revised the full-time ADF target up to approximately 57,800 and the civilian workforce up to 21,900 over the decade. Subsequent reductions in planned savings under the Strategic Reform Program saw the targets grow to around 59,000 and 23,000 for the military and civilian workforces respectively. Additional efficiencies announced in this year's budget sliced 1,000 civilian positions over the next four years. But, as we'll see, actual numbers for both civilians and military personnel have varied considerably from planned figures.

What are the recent trends?

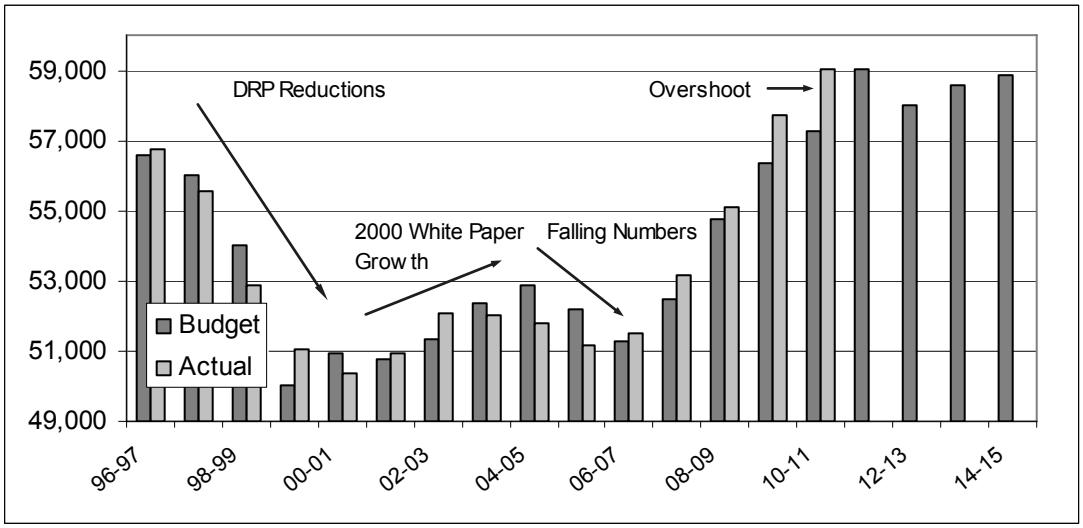
Permanent ADF Numbers

The changing size of the permanent ADF is captured in Figure 2.5.2. In the initial years following the 2000 White Paper, permanent ADF numbers grew steadily until 2003-04 when poor recruiting outcomes saw numbers fall for three years in a row—notwithstanding budgeting for growth in each case. Then, in 2006-07, numbers began to rise to the extent that budget estimates were exceeded three years in a row. All signs being that the revamp of recruiting and retention policy (and a lot of extra money) slowly but steadily turned around the personnel situation.

For the past two years military numbers have grown more quickly than planned as a result of better than expected recruitment and retention. In 2009-10 military personnel exceeded planned levels by 1,372. To redress this unplanned growth, the permanent ADF was supposed to *decrease* by around 400 people in 2010-11. Instead, the ADF grew by a further 1,326 positions, exceeding planned levels by 1,747 (of which 447 positions will be covered by funding for full-time Reservists on operations). The additional numbers have not been shared equally between the three Services. Army has done best, exceeding its target for 2010-11 by 1,424, Air Force by 346 personnel, while Navy fell 23 positions below its target.

So why were military numbers allowed to overshoot so much? The additional cost of these extra personnel in 2010-11 alone will have been in the vicinity of $230 million. Presumably, Defence is loath to undermine the confidence of members regarding the security of Defence employment by discharging surplus personnel. Nonetheless, Defence plans to reduce military numbers to earlier planned levels in 2012-13.

Figure 2.5.2 Permanent ADF personnel: 1996-97 to 2014-15 (average funded strength)



Source: DAR, 2001-02 Defence Budget Brief, 2011-12 PBS and advice from Defence for 2012-13 to 2014-15

Recruitment and retention

The annual change in ADF strength is the difference between the numbers of people recruited into and separated from the force (historically around 5,000 in each case). Since the planned change in strength is usually no more than 1,000, the outcome is finely balanced. With this in mind, we turn now to examine ADF recruitment and separations.

Recruitment
Table 2.5.2 shows the percentages of recruitment targets that have been met over the last fifteen years. Following solid improvements earlier this decade, which saw the rate grow from 76% to 93% in 2001-02, performance dropped back to the mid-80% in 2002-03 and 2003-04 before deteriorating to 80% in 2004-05 and then recovering to 84% for the next two years. In 2007-08 and 2008-09 the result fell to around a 15-year low before recovering strongly in 2009-10.

Table 2.5.2: Percentage of recruitment targets met

	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
Navy	98%	92%	98%	76%	57%	74%	85%	84%	86%	73%	72%	78%	73%	72%	91%
Army	99%	98%	94%	78.5%	83%	79%	100%	79%	84%	81%	98%	86%	76%	76%	90%
Air Force	86%	93%	101%	90.5%	83%	88%	87%	94%	90%	91%	88%	86%	85%	86%	92%
ADF	**96%**	**94%**	**97%**	**80%**	**76%**	**80%**	**93%**	**84%**	**86%**	**80%**	**84%**	**84%**	**77%**	**76%**	**91%**

Source: DAR and Defence submission to the FAD&T References Committee inquiry into ADF recruitment and retention, May 2001.

It is important to note that recruitment results vary from Service to Service, and that within each Service skilled personnel (like technicians and trades people) are particularly hard to recruit. In recent times, this has no doubt reflected the very buoyant labour market and the national skilled labour shortage that Australia has experienced. As the data shows, Navy has had the most trouble.

Retention
Table 2.5.3 shows the percentages of ADF personnel who separated from full-time military service over the last fourteen years. Some care must be taken with this data because figures for earlier years were impacted by the deliberate reduction in the size of the ADF between 1997 and 2001 under the Defence Reform Program. Still, separation rates from 2001-02 to 2004-05 were better than in 1995-96 before the cuts to personnel commenced. Note that the separation rate for 2009-10 is the lowest of all the years examined by a fair margin.

Table 2.5.3: ADF separation rates

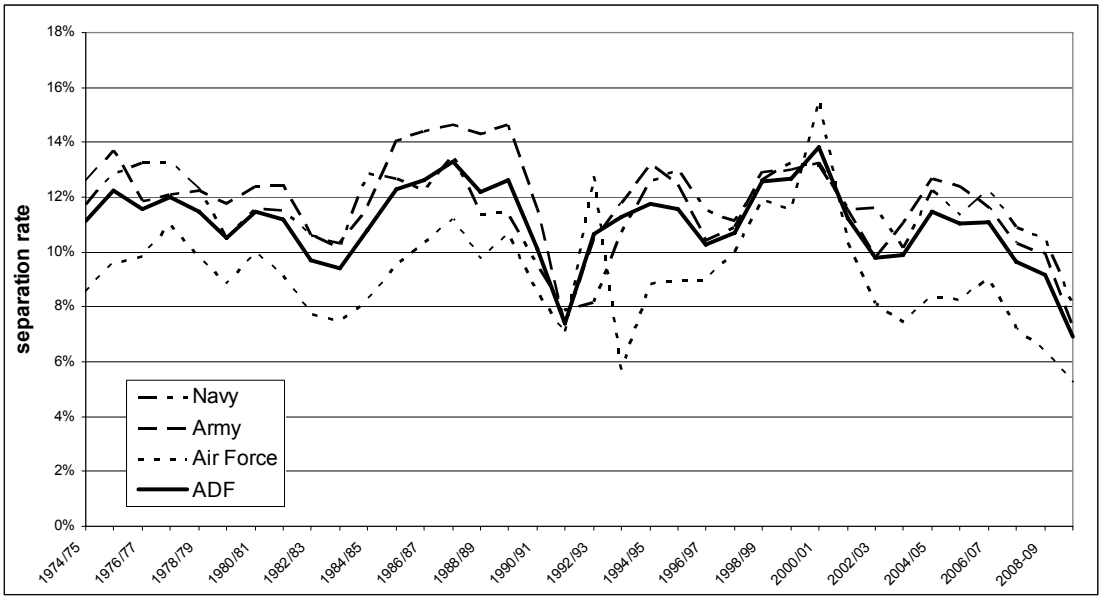
	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
Navy	13.0%	11.5%	11.1%	12.6%	13.3%	13.2%	11.5%	11.6%	10.1%	12.2%	11.3%	12.2%	10.9%	10.5%	8.1%
Army	12.5%	10.4%	10.9%	12.9%	13.0%	13.2%	11.5%	9.8%	11.0%	12.7%	12.4%	11.6%	10.3%	9.9%	7.2%
Air Force	9.0%	9.0%	10.0%	11.9%	11.6%	15.6%	10.4%	8.1%	7.4%	8.4%	8.5%	9.0%	7.2%	6.3%	5.2%
ADF	**11.6%**	**10.3%**	**10.7%**	**12.6%**	**12.7%**	**13.8%**	**11.2%**	**9.8%**	**9.9%**	**11.5%**	**10.7%**	**11.1%**	**9.7%**	**9.2%**	**6.9%**

Source: DAR and Defence submission to the FAD&T References Committee inquiry into ADF recruitment and retention, May 2001.

To put recent ADF separation rates in context, Figure 2.5.3 plots the separation rate over the past thirty years. The key point to notice is that recent separation rates are commensurate with or better than rates achieved over the past three decades. Given that a number of factors have arisen in that time to make long-term ADF service more difficult—growing numbers of employed spouses, greater geographical dispersal of the ADF and the trend in society to shorter-term employment—the fact that the ADF is keeping people on average for the same length of time as in the 1970s is a real achievement.

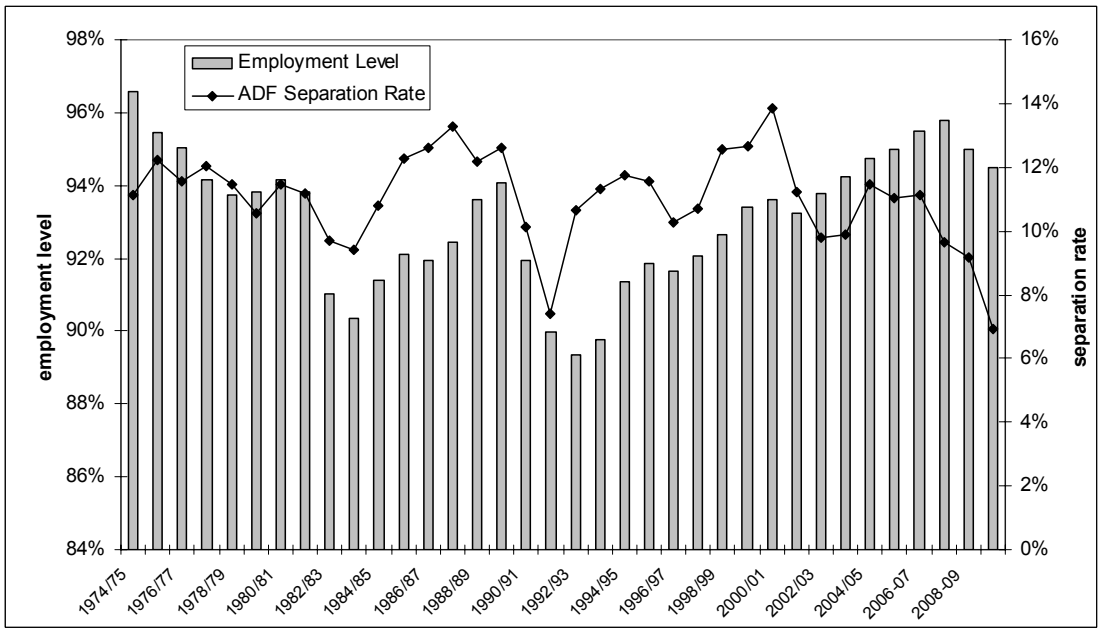
While it's highly likely that the Global Financial Crisis contributed to low separation rates in 2008-09 and 2009-10, the impact of recent retention initiatives has undoubtedly also been an important factor. Indeed, not only did the ADF separation rate fall strongly in 2007-08 (prior to any increase in unemployment) but the correlation between unemployment and separations has been less than clear in recent years—as shown in Figure 2.5.4.

Figure 2.5.3: Permanent ADF separation rate: 1974-75 to 2009-10



Source: DAR 1974-75 to 2009-10

Figure 2.5.4: Employment and ADF separation rates: 1974-75 to 2009-10



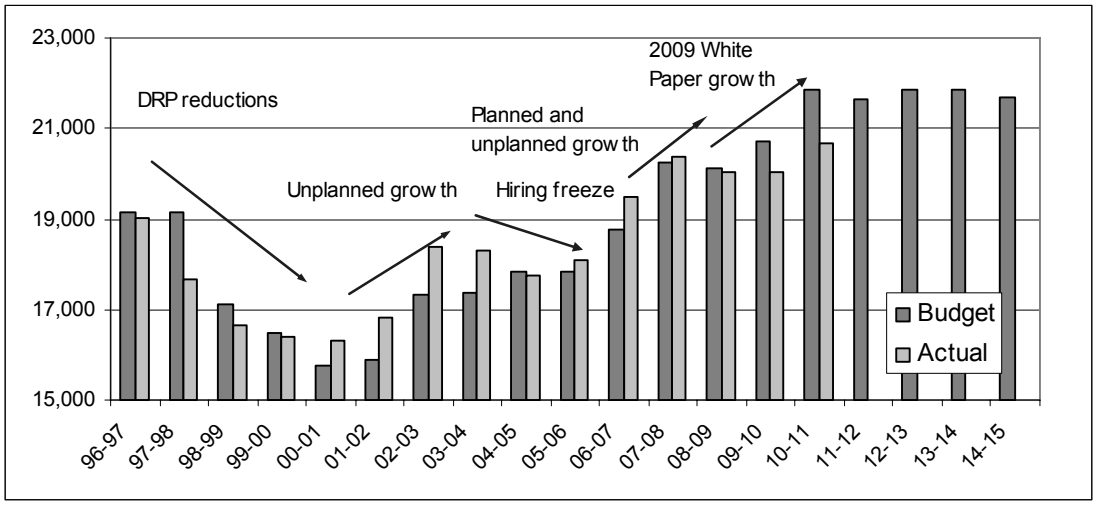
Source: DAR 1974-75 to 2009-10

Civilian Numbers

The situation with civilian numbers is captured in Figure 2.5.5 which plots budgeted and actual civilian numbers from 1996-07 onwards. Although civilian numbers fell quickly under the Defence Reform Program, they grew back very rapidly in the first

two years of the 2000 White Paper implementation—three times more quickly than military numbers grew. What is more, the growth was largely unplanned, with the size of the civilian workforce in 2001-02 exceeding budget estimates by 5.8% and similarly in 2002-03 (6.1% in excess). However, in January 2003 a civilian hiring freeze was imposed within Defence after it became clear that the projected number of civilian personnel would exceed the revised estimate given less than two months earlier. In April 2003, the freeze was lifted but direction was given to maintain civilian numbers at current levels. In the 2003-04 Budget, a programmed reduction plan was set in place to reduce civilian numbers by 1,008, from 18,385 to 17,377.

Figure 2.5.5: Civilian personnel: 1996-97 to 2014-15



Source: Defence Annual Reports, 2001-02 Defence Budget Brief and 2011-12 PBS

However, the actual result for 2003-04 (18,303) was only 82 positions below the previous year's figure due, mainly, to a series of government initiatives but also because of an extra unplanned 349 new civilian positions.

For a while, in 2004-05 and 2005-06, personnel numbers were largely under control resulting in a close alignment of budgeted and actual figures. In 2006-07, civilian personnel numbers were set to rise by 950. Most, but not all, of these positions were related directly to either new government initiatives or the creation of a more efficient workforce. However, the actual result for 2006-07 was an increase of 1,388 personnel, more than 450 above the estimate. Then, in 2007-08, civilian numbers grew by another 1,468, fully 155 above the initial budget estimate. Clearly, whatever constraints were imposed in 2004-05 and 2005-06 were no longer effective.

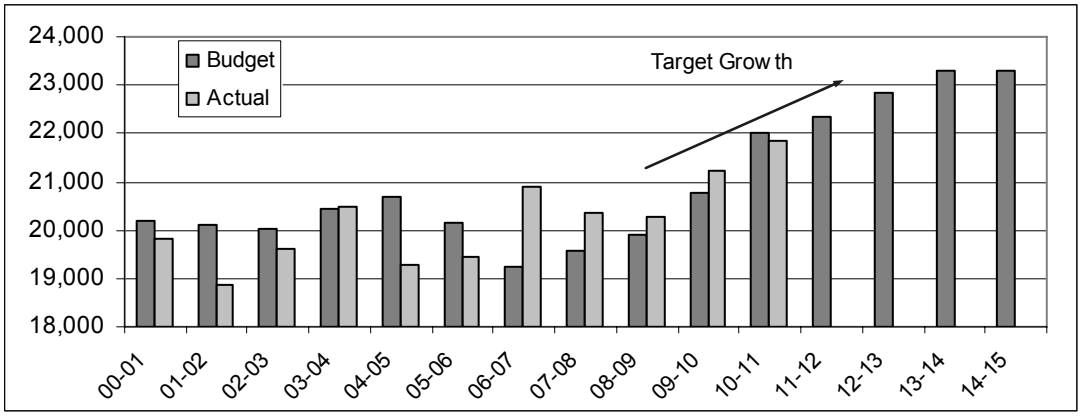
The plan for 2008-09 was for civilian numbers to fall to around 20,000 and then remain largely static across the forward estimates. However, following the 2009 White Paper civilian personnel numbers were set a target of around 21,900 which was subsequently revised upwards to around 23,000 after many reductions due to efficiency savings were abandoned.

However, in 2009-10 the number of civilians grew by only 17, fully 645 below the updated budget estimate. Attempts to regain lost progress in 2010-11 largely failed with civilian numbers falling 1,205 below target (though still 588 above the level for the previous year). Just prior to this year's budget, the government announced that civilian numbers would be 1,000 less than initially planned across the next four years as part of further efficiencies. See Chapter 4 of this brief for a fuller discussion.

Reserve numbers

Consistent with the unplanned growth in permanent military numbers, Reserve force strength jumped above estimates in 2009-10 accelerating long-term planned growth. However, the projected outcome for 2010-11 is 168 below that budgeted for.

Figure 2.5.6 Active Reserve personnel: 2000-01 to 2013-14



Source: Defence Annual Reports and 2011-12 PBS

What are the long-term targets for the Defence workforce?

In past years, we have included a detailed analysis of how personnel targets have evolved since the 2000 Defence White Paper. Because the 2009 Defence White Paper effectively 'reset the clock', we will instead focus on the evolution of planned personnel numbers from 2009 onwards and only provide a truncated picture of earlier changes. Table 2.5.4 shows what we know about the long-term target strength for the ADF.

The picture for civilians is similar as shown in Table 2.5.5, where the baseline has fallen by 52 positions and the savings from the SRP have been reduced by 824 positions. Once again, however, further cuts may be made at a later date. It has been assumed that the May 2011 reduction transfers though to the final end state.

Table 2.5.4: Long-term target (circa 2018) for the permanent ADF

	Navy	Army	Air Force	Total
Post-Defence Reform Program Baseline	**13,800**	**23,000**	**13,000**	**50,000**
East Timor Boost 1999		+3,000	+555	+3,555
2000 White Paper Target	**13,800**	**26,000**	**13,555**	**53,555**
Changes made 2000 to 2009	-311	+4,538	+500	+4,721
Estimated pre-2009 White Paper Target	**13,689**	**30,538**	**14,055**	**58,282**
Baseline (May 2009)				**58,648**
Extra White Paper Positions				1,979
SRP impact				-2,813
2018-19 target strength (May 2009)				**57,812**
Baseline (April 2010)				**58,276**
Extra White Paper Positions				1,979
SRP impact				-1,376
2018-19 target strength (April 2010)				**58,879**
2018-19 target strength (May 2011)				**58,627**

Source: Budget Papers and the May 2009 and April 2010 SRP Booklets

Table 2.5.5: Long-term target (circa 2018) for the Defence civilians & contractors

	Civilian	Contractors	Total
Estimated pre-2009 White Paper Target	**20,000**	**-**	**-**
Baseline (May 2009)			**21,672**
Extra White Paper Positions			2,290
SRP impact			-2,015
2018-19 target strength (May 2009)			**21,937**
Baseline (April 2010)			**21,620**
Extra White Paper Positions			2,290
SRP impact			-1,191
2018-19 target strength (April 2010)			**22,719**
Baseline (April 2011)*			**22,397**
Reduction of 1,000 positions			-1,000
2018-19 target strength (May 2011)			**21,397**

Source: Budget Papers and the May 2009 and April 2010 SRP Booklets. *Advice from Defence May 2011.

How much do personnel cost?

Personnel expenses for Defence including DMO in 2011-12 will be around $10.2 billion rising to $11.1 billion in 2014-15. Apart from a gap pending the release of the 2010-11 annual report (where we have interpolated) it is possible to calculate the recent and estimated per-capita cost of civilian and military personnel over time. The results of this calculation appear in Tables 2.5.6 to 2.5.8. The per-capita expenses include salaries, allowances, superannuation, health, redundancies, housing and fringe benefits tax. We've done our best (on the basis of incomplete information) to account for the cost of Reserve personnel in the estimate for the permanent ADF. In addition, the transfer of military compensation to Veterans Affairs in 2004-05 has been adjusted for.

Table 2.5.6: Per-capita permanent ADF personnel expenses

	Military Numbers	Expense $ 000's	Per Capita	Nominal Growth
00-01	50,355	4,047,121	$80,372	
01-02	50,932	4,273,863	$83,913	4.4%
02-03	52,080	4,458,208	$85,603	2.0%
03-04	52,034	4,890,100	$93,979	9.8%
04-05	51,813	4,757,900	$91,828	-2.3%
05-06	51,151	5,093,100	$99,570	8.4%
06-07	51,504	5,515,651	$107,092	7.6%
07-08	53,109	6,062,882	$114,159	6.6%
08-09	54,748	6,764,100	$123,550	8.2%
09-10	57,697	7,456,595	$129,237	4.6%
10-11*	59,023	7,755,647	$131,400	1.7%
10-12	59,053	7,765,572	$131,502	0.1%
12-13	58,928	7,773,670	$131,918	4.6%
13-14	58,872	8,133,292	$138,152	4.7%
14-15	59,546	8,420,357	$141,409	4.9%
			Average	**4.7%**

Source: Defence Annual Reports and 2011-12 PBS, expenses adjusted to take account of Reserve component.
*Estimated from 2010-11 PAES and 2011-12 PBS

Table 2.5.7: Per-capita DMO civilian personnel expenses

	DMO Civilians	DMO Expenses '000s	DMO Per Capita	Nominal Growth
05-06	4502	$353,892	$78,608	
06-07	4951	$409,262	$82,662	5.2%
07-08	5304	$458,992	$86,537	4.7%
08-09	5657	$457,613	$80,893	-6.5%
09-10	5526	$507,900	$91,911	13.6%
10-11	5510	$508,000	$92,196	0.3%
11-12	5647	$572,263	$101,339	9.9%
12-13	5744	$621,946	$108,278	6.8%
13-14	5874	$658,037	$112,025	3.5%
14-15	6096	$711,622	$116,736	4.2%
			Average	**4.6%**

Source: Defence Annual Reports and 2011-12 PBS.
Note: excludes DMO past 2005-06. *Estimated from 2010-11 PAES and 2011-12 PBS

Table 2.5.8: Per-capita Defence civilian personnel expenses

	Civilian Numbers	Expense $ 000's	Per Capita	Nominal Growth
00-01	16,292	$956,661	$58,720	
01-02	16,819	$1,086,116	$64,577	10.0%
02-03	18,385	$1,235,752	$67,215	4.1%
03-04	18,303	$1,363,205	$74,480	10.8%
04-05	17,753	$1,293,100	$72,838	-2.2%
05-06	13,577	$1,084,382	$79,869	9.7%
06-07	14,516	$1,212,393	$83,521	4.6%
07-08	15,087	$1,271,223	$84,259	0.9%
08-09	14,815	$1,308,445	$88,319	4.8%
09-10	14,532	$1,373,377	$94,507	7.0%
10-11*	15,146	$1,473,115	$97,261	2.9%
10-12	16,001	$1,575,937	$98,490	1.3%
12-13	16,114	$1,600,354	$99,315	4.9%
13-14	15,972	$1,603,263	$100,380	4.4%
14-15	15,611	$1,665,578	$106,693	4.5%
			Average	**4.8%**

Source: Defence Annual Reports and 2011-12 PBS.
Note: excludes DMO past 2005-06. *Estimated from 2010-11 PAES and 2011-12 PBS

The average rates of growth for per-capita employee expenses in Table 2.5.6 to 2.5.8 do not account for inflation. Once inflation is taken into account, the calculated average annual rates of growth for the three groups are as follows: permanent military personnel 1.9 %, Defence civilians 2.0% and DMO civilians 1.8%. However, these relatively low figures only arise because the PBS shows per-capita personnel expenses growth will be contained over the next few years—see Table 2.5.9.

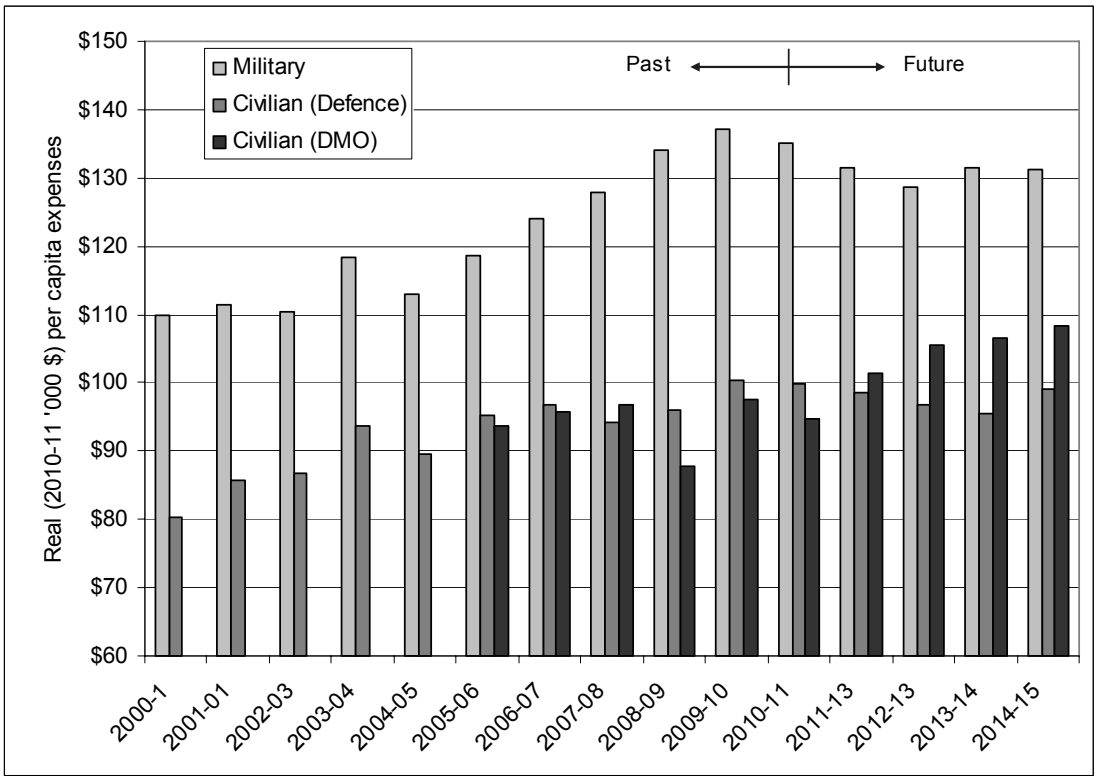
Table 2.5.9: Past and projected average annual real growth in per-capita costs

	Military	Civilian
2000-01 to 2009-10	2.6%	2.7%
2009-10 to 2014-15	0.1%	1.5%

It may be that the fall in per-capita costs comes about, in part at least, because the latter years of the forward estimates do not include the allowances presently being paid to deployed personnel. Or there may simply be an error. Defence's optimism about containing salaries is apparent in Figure 2.5.7 which graphs past and projected real per-capita costs.

Finally, a caution is in order when looking at the data in the last three tables; the ongoing impact of accrual (non-cash) shifts can make very significant differences. This has probably contributed to some of the big year-on-year variations in growth in both civilian and military per-capita expenses.

Figure 2.5.7: Past and projected per-capita personnel costs



Source: Defence Annual Reports and 2011-12 PBS.
Note: excludes DMO past 2005-06. *Estimated from 2010-11 PAES and 2011-12 PBS

Personnel structures

To facilitate understanding of the structure of the Defence workforce, it is useful to understand the nominal equivalence between different levels in the APS and ADF and between the three Services. A comparison of relative ranks/levels has been provided in Table 2.5.10 overleaf.

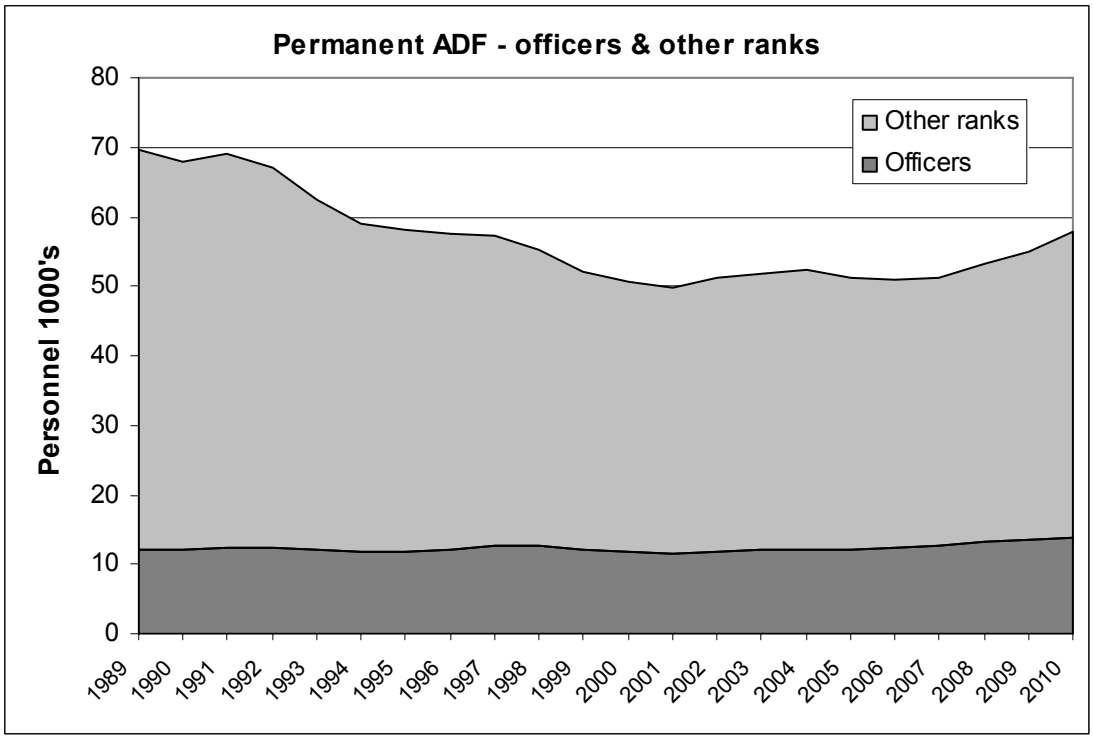
The breakdown of ADF personnel by rank, and civilians by level, appears in Table 17 on page 40 of the PBS. As the ADF contracted during the 1990s, the number of officers remained more or less constant. Then, as the size as the ADF grew over the past few years, the number of officers grew more quickly (see Figure 2.5.8). As a result, the percentage of officers in the ADF has grown from 17.2% in 1989 to 23.9% in 2010. This means that there are now around three enlisted men for every officer. To a large extent, the rising proportion of officers probably reflects the outsourcing of

activities during the 1990s which saw more enlisted personnel than officers discharged. Moreover, the recent expansion of the army has marginally reversed the trend. In comparison, recent figures for the UK and US are around 19% and 16% respectively although it should be noted that they both have larger economies of scale.

Table 2.5.10: Rank/level comparison:

Civilian	Navy	Army	Air Force	
APS-4	Sub-Lieutenant	Lieutenant	Flying Officer	Officers
APS-5	Lieutenant	Captain	Flight Lieutenant	
APS-6	Lt-Commander	Major	Squadron Leader	
EL-1	Commander	Lt-Colonel	Wing Commander	Senior Officers
EL-2	Captain	Colonel	Group Captain	
SES-1	Commodore	Brigadier	Air Commodore	Star-ranked and Senior Executive Service
SES-2	Rear Admiral	Major General	Air Vice-Marshal	
SES-3	Vice Admiral	Lt General	Air Marshal	

Figure 2.5.8: Permanent ADF Numbers 1989 – 2010 as at 30 June



Source: Defence Annual Reports 1989-90 to 2009-10.

Generals and Mandarins

The trends in star rank, senior executive, and senior officer numbers are shown in Table 2.5.11; the most recent data is taken from the 2011-12 PBS. Changes in reporting account for the gaps and lack of earlier data.

Table 2.5.11: Numbers of Senior Ranks and Executive Levels; average funded strength

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	%
Civilian															
Execs (Defence)	100	106	103	117	130	123	96	102	108	121	126	128	-	-	
Execs (DMO)							30	29	29	32	35	36	-	-	
Total	**100**	**106**	**103**	**117**	**130**	**123**	**126**	**131**	**137**	**153**	**161**	**164**	**164**	**165**	**65%**
Senior Officers[1] (Defence)	0	0	3317	3844	3824	3889	3081	3385	3656	3911	3970	4192	-	-	
Senior Officers[1] (DMO)	0	0	0	0	0	0	995	1064	1225	1388	1502	1579	-	-	
Total	**0**	**0**	**3317**	**3844**	**3824**	**3889**	**4076**	**4449**	**4881**	**5299**	**5472**	**5771**	**6253**	**6416**	**93%**
Military															
Star Officers	110	0	120	119	120	119	125	135	149	176	169	173	184	183	**66%**
Senior Officers[2]	1360	0	1415	1467	1507	1528	1551	1594	1684	1768	1852	1937	1871	1893	**39%**

Source: Defence Annual Reports and 2010-11 PAES and 2011-12 PBS

As shown, in the past fourteen years the number of civilian senior executives has increased by 65% and military star-rank officers by 66%. At the same time, the civilian workforce grew by only 30% and the military workforce by only 12%. Over a similar time frame, the numbers of civilian and military senior officers have grown by 93% and 39% respectively. However, the fastest rate of increase has occurred at the level of Deputy Secretary and 3-star military officer (Table 2.5.12) where much of the growth is very recent, including as a result of the 2007 Defence Management Review.

Table 2.5.12: Band 3 and 3-Star officers (equiv. Chief of Service - Deputy Secretary)

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	%
Band-3 (Defence)	3	4	7	5	5	5	5	5	5	7	8	8	8	8	166%
Band 3 (DMO)*	1	1	1	1	1	1	1	1	1	4	4	5	5	5	400%
Band-3[#] (DSTO)	2	3	2	3	3	3	3	3	3	3	3	3	3	3	50%
subtotal	**6**	**8**	**10**	**9**	**9**	**9**	**9**	**9**	**9**	**14**	**15**	**16**	**16**	**16**	**167%**
3-Star Officers	4	4	4	4	4	5	5	5	5	6	6	6	6	6	50%
Total	**10**	**12**	**14**	**13**	**13**	**14**	**14**	**14**	**14**	**20**	**21**	**22**	**22**	**22**	**120%**

*Source: Defence Annual Reports and 2011-12 PBS. [#]Chief of Division Grade 3 in Defence Science and Technology Organisation. *Includes CEO which was previous deputy secretary level*

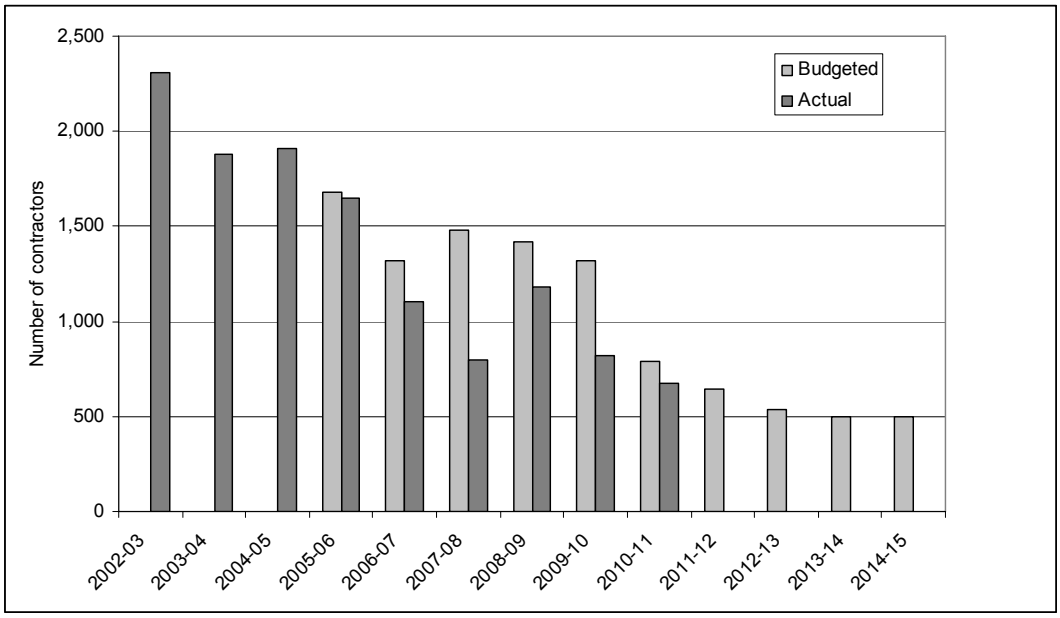
At every senior level in the civilian and military workforce the number of managers and executives has increased at a rate well in excess of the growth in the size of the overall workforce.

Professional Service Providers

The Defence workforce includes a limited number of Professional Service Providers (PSP), sometimes called simply 'contractors' in line positions within the organisation. For most of the past decade, there was a concerted effort underway to reduce the number of PSP employed by Defence and DMO. In fact, Defence has claimed successive reductions in the number of PSP as an internal efficiency and are doing so

again within the SRP. Note the temporary increase in 2008-09 against which savings were calculated in 2009.

Figure 2.5.9: Professional Service Providers

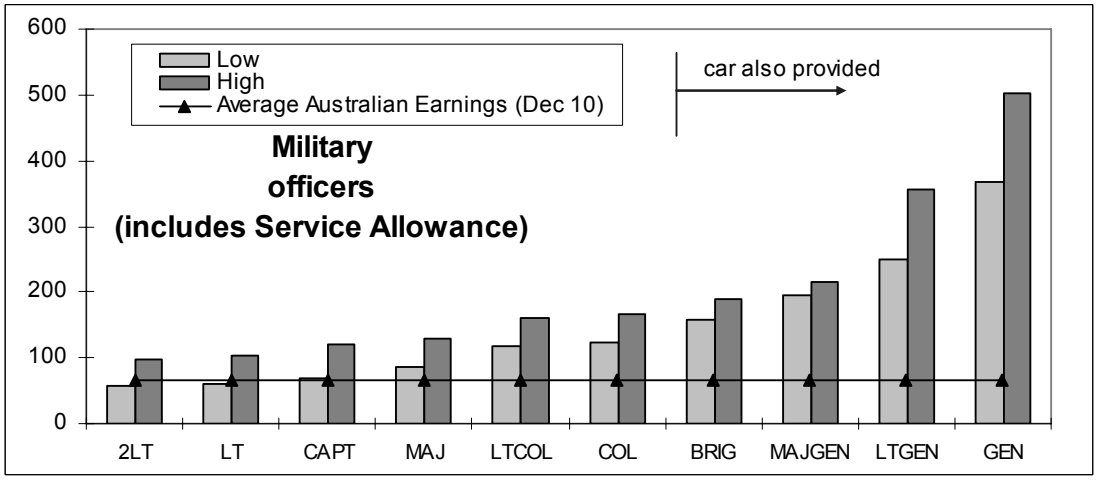


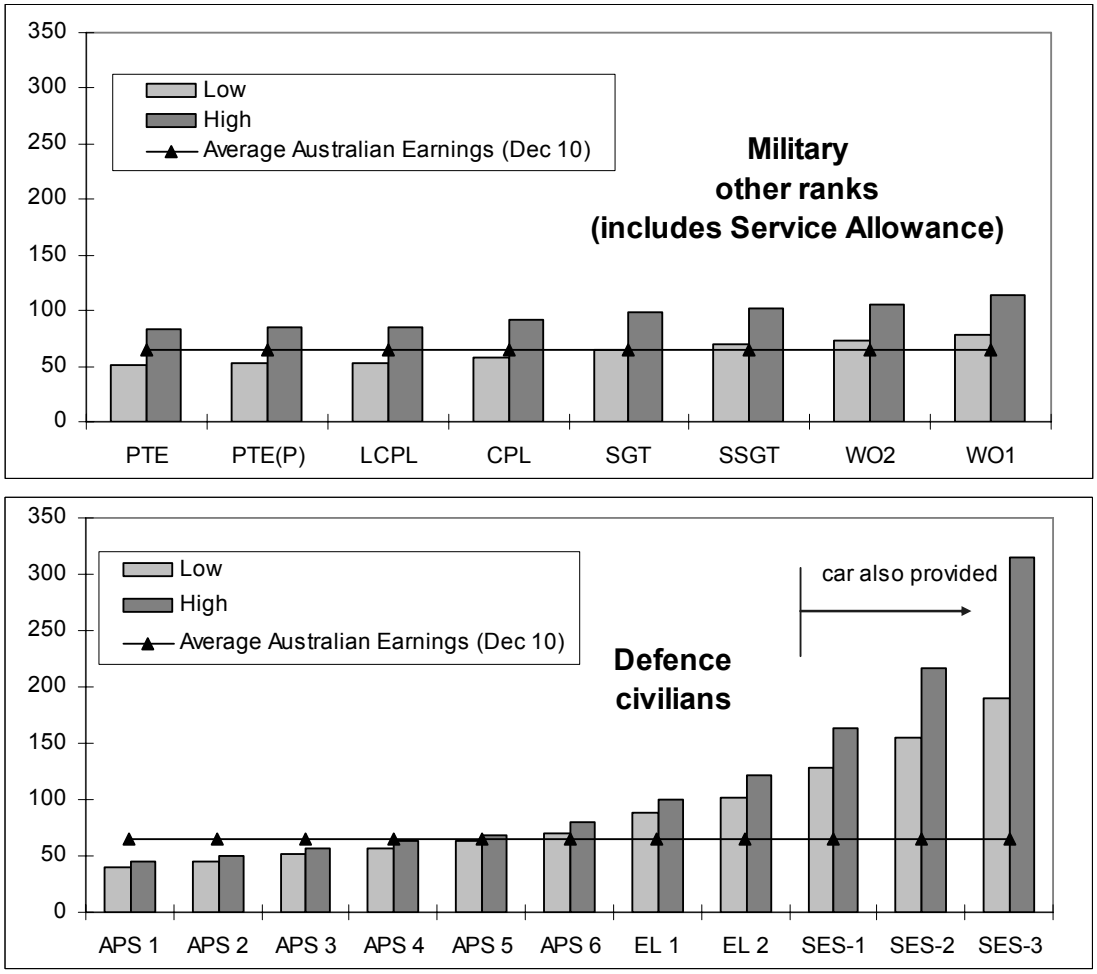
Source: Defence Annual Reports and 2011-12 PBS.

Defence Remuneration

The PBS does not deal with Defence remuneration. But because the largest single slice of the Defence budget goes towards civilian and military salaries we have included a short summary of the key data. Figure 2.5.10 shows Defence military and civilian salaries circa late-2010 benchmarked against the latest available Average Weekly Ordinary-Time Earnings for Full-Time Earning Adults (AWOFTEA) from December 2010. (SES civilian and military two/three-star data are for mid-2010.)

Figure 2.5.10 Defence salaries, late 2010





Source: ABS weekly earnings data; Defence pay rates from http://www.defence.gov.au/dpe/pac/
Note: SES, LTGEN and GEN pay rate are from June 2010 (2009-10 DAR)

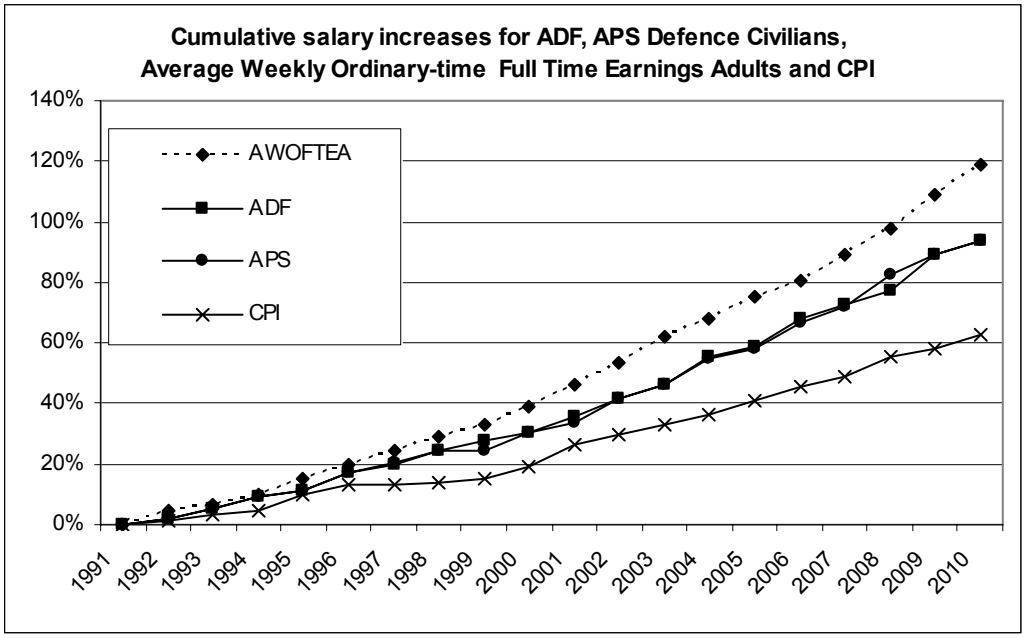
Note that the military figures in Figure 2.5.10 include both salary and the service allowance of $11,662 per annum received by all service personnel below the rank of Colonel. No account has been taken of the ancillary benefits received by military personnel like housing, medical, rations and specific allowances for skill, hardships and deployments. Note that the three graphs do not use the same scale.

The comparison of defence salaries with AWOFTE in Figure 2.5.10 represents only a snapshot in time. The relative dynamics of average earnings, defence salaries and the cost of living is quite another issue. Indeed, as Figure 2.5.11 shows, over the past decade and a half, defence salaries have consistently grown more slowly than average earnings but more quickly than the Consumer Price Index (CPI).

Four points can be made about the relative growth in average earnings, defence salaries and consumer prices. First, because the salary increases for the (largely distinct) ADF and APS workforces are explicitly linked, any suggestion that they are driven by productivity is tenuous to say the least.

Second, the fact that average earnings have outpaced defence salaries does not necessarily mean that defence remuneration has failed to keep pace with community standards. It's likely that the stronger growth in average earnings actually reflects structural changes in the Australian workforce rather than a disparity in like-for-like remuneration.

Figure 2.5.11: Defence civilian and military salaries – rate of increase



Source: ABS weekly earnings data and Defence pay rates.

Third, the actual remuneration of civilian personnel has increased much more quickly than for the military workforce, in part, through the 'level enrichment' shown in Table 2.5.13 (Civilian senior officers make up 28% of the civilian workforce while military senior officers only account for less than 3%, so that the former is much more sensitive to growth than the latter.) The effect is significant. Comparing per capita wages, salaries and leave expenses over the decade 1998-99 to 2008-09 reveals that average per-capita ADF costs grew by 43% while civilian costs grew by 61%. Over the same period, average weekly earnings in the broader economy grew by 57%.

Finally, it is important to note that Defence executive remuneration is not limited by the salary increases granted to the rank and file. Over the past three years, the Defence annual report disclosed salary ranges for various levels of employee. As Table 2.5.13 shows, it has been a particularly good time for senior executives and star-ranked officers (with the exception of 3-star military officers who only received almost the same as that granted to the lower echelons). The range of increases corresponds to changes to the upper and lower levels of the salary range in each case.

Table 2.5.13: Senior executive salary increases 2005-06 to 2009-10

Civilian level	Increase	Military level	Increase
Deputy Secretary SES-3	20-54%	Lieutenant General (E) 3-star	17-61%
First Assistant Secretary SES-2	21-28%	Major General (E) 2-star	31-38%
Assistant Secretary SES-1	22-27%	Brigadier 1-star	21-36%
Non-executive APS	17.5%	Non-star ranked ADF	18.9%

Source: 2005-06 and 2009-10 DAR. Non-executive figures are taken from ADF pay rates and civilian DECA.
Note: Military 3-star remuneration is independently set by the Remuneration Tribunal.

Longer-term trends in executive salaries are difficult to extract due to the paucity of historical data. Nonetheless, it is possible to track the growth in average senior

executive remuneration over the past decade. As Table 2.5.14 shows, increases to average executive (military plus civilian) remuneration have comfortably outpaced that for average civilian and military salaries and wages.

Table 2.5.14: Per capita increases 1998-99 to 2009-10

	1998-99 ($)	2009-10 ($)	Percentage increase
Average senior executive remuneration	144,513	255,571	76.8%
Average ADF salary/wages plus leave and superannuation	61,878	97,683	57.9%
Average APS salary/wages plus leave and superannuation	52,870	91,219	72.5%

Source: 1998-99 and 2009-10 DAR

Demographics of the ADF

The defence force is disproportionately drawn from the Anglo-Celtic part of the Australian population. The extent of over-representation is difficult to fully assess because the only available data concerns country of birth and not family background. Even so, as Table 2.5.15 shows, there are significant differences between the defence force and the community (similar results were found in the 1999 ADF Census). The essential results are reproduced graphically in Figure 2.5.12. The figures are similar for the part-time Reserve force. Note that the over-representation of Anglo-Celtic born individuals extends to the civilian workforce of the Department of Defence.

Table 2.5.15: Ethnic composition of the Australian Defence Force

Place of Birth	Defence Force 2007	Australian Population 2006	Australian Workforce 2006	Defence Civilians 2007
Australia	87%	71%	73%	79%
UK and Ireland	5%	5%	6%	8%
New Zealand	2%	2%	3%	1%
Europe	1%	3%	3%	3%
Asia	1%	6%	7%	4%
Other	4%	12%	8%	5%

Sources: Defence military and civilian figures from the 2007 Defence Census; all other figures from Census 2006 conducted by the Australian Bureau of Statistics.

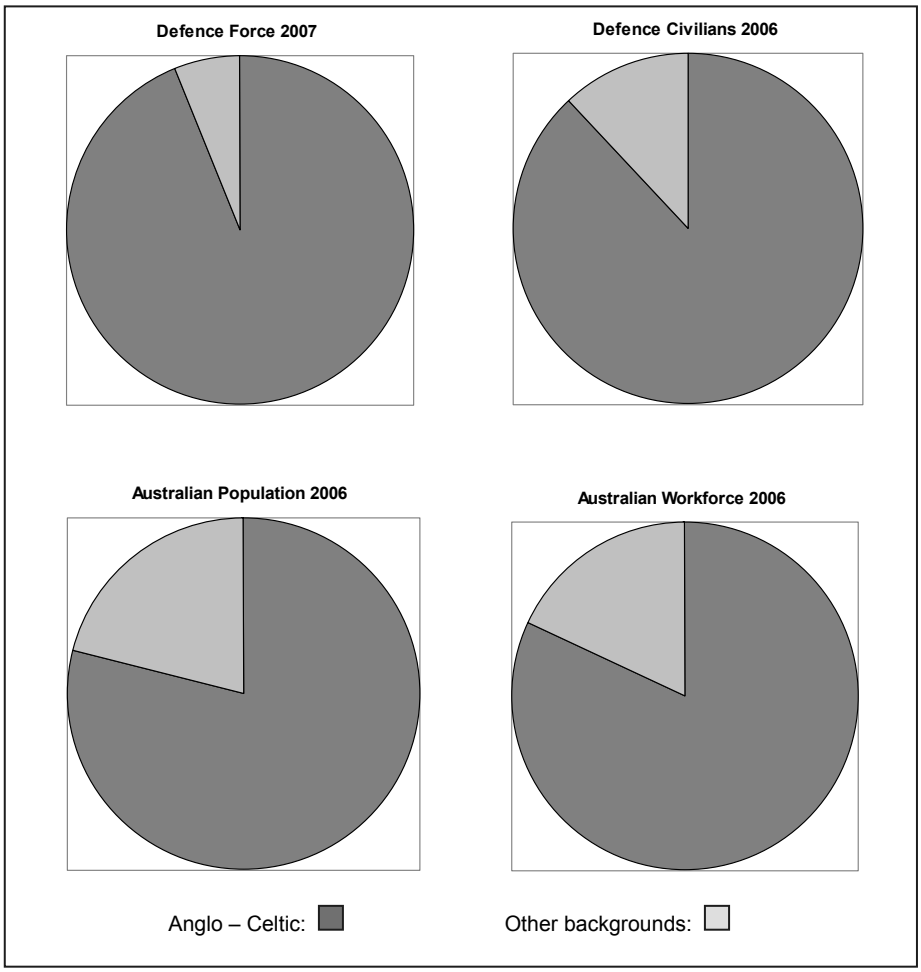
It is disappointing that our defence force is unable to attract recruits equally from across the Australian community. Defence advises that programs are underway to redress the issue including the Multicultural Recruitment and Retention Strategy.

Another area where the demographics of the Australian defence force and the society differ is gender. Table 2.5.16 shows the proportion of women and the share of jobs open to women, across the permanent uniformed and civilian workforces. Similar results hold for the part-time Reserve force.

It is not that the defence force has ignored the issue. Over at least the past fifteen years a serious effort has been mounted to recruit and retain women in the force. A zero-tolerance policy towards sexual harassment is now in place across the entire force. Recruiting advertisements depict women as integral members of the defence force and highlight the opportunities available to them (and the same has more recently become true for persons from diverse ethnic backgrounds). The number of positions open to women has been expanded in all three Sevices and an increasing

number of women are reaching the higher ranks. More flexible arrangements are now in place to help female members manage the dual demands of career and family, and childcare facilities have been established in and around most military bases.

Figure 2.5.12: Ethnic composition of the ADF by birth



Sources: Defence military and civilian figures from the 2007 Defence Census; all other figures from Census 2006 conducted by the Australian Bureau of Statistics.

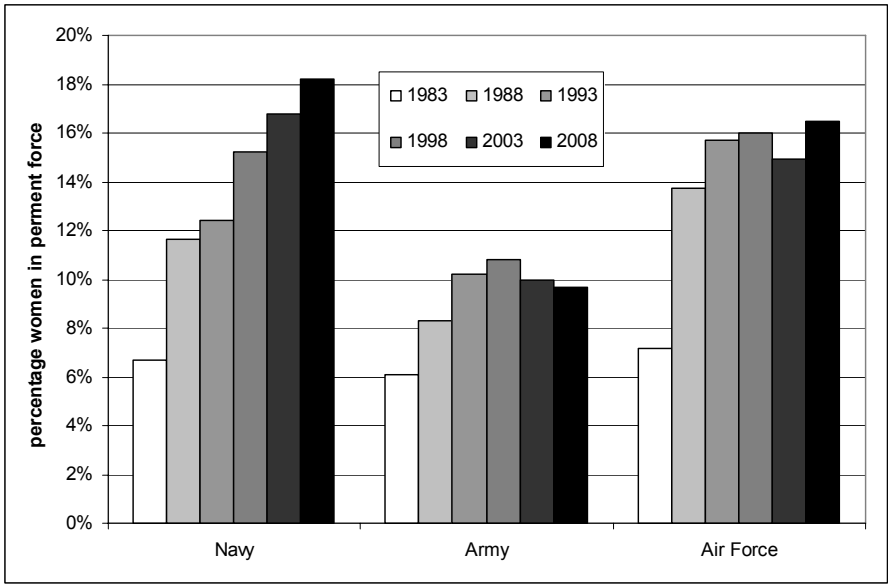
Table 2.5.16: Women in Defence (full time)

	Navy	Army	Air Force	Total military	Defence civilians
% of positions open to women				93%	100%
% of women in uniform	18.4%	9.7%	17.8%	13.8%	37.9%

Source: 2009-10 DAR and advice from Defence on positions open

Yet, the proportion of women in the force has grown from only 12.8% to 13.8% over the decade, see Figure 2.5.13. The proportion of women in allied forces is similarly low—New Zealand 17%, United Kingdom 8.5% and United States 17%. That does not mean that the defence force should relax its effort to attract women to serve. The defence force needs the best people it can find and women represent the largest underutilised pool of potential recruits in the community.

Figure 2.5.13: Women in the defence force



Source: 1982-82 to 2007-08 DAR

2.6 Outcomes and planned performance [PBS Section 2]

The Cost of Outcomes and Programs

Under the framework explained in Chapter 1.3 of this Brief, the government funds Defence to achieve designated outcomes via a series of programs. The core of the Defence Budget is a statement of the costs and planned performance of outcomes and programs on p.42–107 of the PBS. Unfortunately the 2009-10 transition from 'output groups' to 'programs' was accompanied by the abandonment of 'outputs' that contained a more granular explanation of capabilities held by the three Services. Specifically, twenty-two capability related outputs were coalesced into a mere three programs resulting in a seven-fold decrease in information.

The net cost (revenues minus expenses) of outcomes and programs appear in Table 2.6.1. To capture the overall cost of delivering programs, non-cash expenses due to the depreciation of equipment are included in the net cost. Funds appropriated for administered programs (which are not controlled by Defence) for home-loan assistance and military superannuation and retirement benefits have been omitted.

Table 2.6.1 Net outcome and program costs ('000s)

Outcome 1: The protection and advancement of Australia's national interests through the provision of military capabilities and the promotion of security and stability	**Net Cost 2008-09 (actual)**	**Net Cost 2009-10 (actual)**	**Net Cost 2010-11 (revised)**	**Net Cost 2011-12 (budget)**
Program 1.1: Office of the Secretary and CDF	207,055	196,250	176,353	172,623
Program 1.2: Navy Capabilities	3,979,224	3,744,936	3,804,946	4,051,659
Program 1.3: Army Capabilities	5,014,621	5,093,356	4,921,024	4,926,814
Program 1.4: Air Force Capabilities	3,905,684	3,698,512	3,806,055	4,007,321
Program 1.5: Intelligence Capabilities	501,071	561,908	510, 285	530,650
Program 1.6: Defence Support	3,168,997	3,319,103	3,385,488	3,528,819
Program 1.7: Defence Science and Technology	374,906	403,156	447,291	433,695
Program 1.8: Chief Information Officer	696,623	806,069	830,130	779,918
Program 1.9: Vice Chief of the Defence Forces	1,317,631	1,012,042	844,363	855,506
Program 1.10: Joint Operations Command	95,462	102,864	42,625	46,328
Program 1.11: Capability Development	129,739	364,956	531,733	747,849
Program 1.12: Chief Finance Officer	818,598	316,814	211,756	644,488
Program 1.13: People Strategies and Policy	256,727	285,916	259,446	326,240
Departmental outputs contributing to Outcome 1	**20,466,338**	**19,905,882**	**19,261,210**	**21,051,910**
Outcome 2*:* The advancement of Australia's strategic interests through the conduct of military operations and other tasks as directed				
Program 2.1: Operations contributing to the security of the immediate neighbourhood	173,161	160,911	213,101	203,669
Program 2.2: Operations supporting wider interests	557,360	892,176	1,352,167	1,375,285
Outcome 3: Support for the Australian community and civilian authorities as requested by Government				
Program 3.1: Defence Contribution to National Support Tasks in Australia	14,557	10,620	15,252	9,829
Total net cost (non-administered)	**21,211,416**	**20,969,589**	**20,841,730**	**22,640,693**

Source: 2011-12 PBS and various DAR

While one might expect that Outcome 2 would include the net additional cost of operations undertaken by the ADF, the total figure is more than $300 million below that given in Table 13, page 32 of the PBS. The only explanation for this discrepancy that we can think of is that the difference is capital investment in equipment in support of deployments—though one might expect the cost of equipment to be higher.

The outcome and programs for the DMO are listed in the second part of the PBS [p. 157, 185 & 197], for convenience these are listed in Table 2.6.2.

Table 2.6.2: Total outcome and program expenses ('000s)

Outcome 1: Contributing to the preparedness of the Australian Defence Organisation through acquisition and through-life support of military equipment and supplies	Expense 2008-09 (actual)	Expense 2009-10 (actual)	Expense 2010-11 (revised)	Expense 2011-12
Program 1.1 — Management of Capability Acquisition	4,841,871	5,963,413	4,949,004	5,326,380
Program 1.2 — Capability Sustainment	4,772,368	4,623,545	4,878,690	5,684,625
Program 1.3 — Policy Advice and Management Services	75,486	91,867	90,746	116,042
Total DMO Outcome 1	9,689,725	10,678,826	9,918,440	11,127,047

Source: various DAR, 2011-12 PBS

There is considerable overlap between the funds listed under the Defence outcomes/outputs and those for DMO. Around $5.7 billion worth of Defence's program costs represent the purchase of sustainment services from DMO (Output 1.2). Put simply, around half of DMO's programs are inputs to Defence's programs. DMO's other $5.3 billion program (Program 1.1) does not contribute to Defence's outputs. Instead, it represents the purchase of new capital equipment that will be used to deliver Defence's programs in the future.

As mentioned in Chapter 1, the new outcomes and programs are much more closely aligned with the actual organisation of Defence than were those employed from 1999-00 to 2007-08. Nonetheless, there are significant linkages between certain elements. We have tried to capture the situation in Figure 2.6.1. The essential points are as follows. The programs under Outcome 2 and 3 do not align with any single organisational entity. Instead they capture the net additional cost of operations that is apportioned to those groups that actually support and deliver the operations including DMO. At the same time, the DMO sustainment budget is reflected in the costs attributed to the various output groups, principally Navy, Army and Air Force.

Program Statements

For each of the programs, the PBS contains an entry detailing the key performance indicators and a cost summary. In many cases, the key performance indicators read like the entries in a corporate plan. For example, the Office of the Secretary and CDF has seventeen deliverables including;

'...provide overarching strategic guidance, policy and supporting plans to inform Defence decision making including the development and use of Defence capability and the deployment of the ADF.'

and four performance indicators, including;

'...the Ministers are satisfied with the timeliness and quality of advice, including Cabinet documentation, provided by the Department.

Little would be gained by rehearsing the very large number of equally sensible (and largely anodyne) key performance indicators that appear in the PBS. The interested reader can pursue them at leisure. Of more interest are the concrete performance measures set out for the military capability outputs.

Capability Performance

There are three key performance measures for the capability related programs; preparedness, core skills and quantity. These same performance measures have been employed in Defence Annual Reports and PBS in one way or another since 1999. We explore these three measures below. In doing so, it's important to remember that many capability programs have additional specific performance measures.

Preparedness refers to the readiness and sustainability of the ADF to undertake operations, be it national support tasks, peacekeeping or war. The process by which preparedness targets are set is worth recounting.

To begin with, the government's White Paper sets out the broad strategic tasks that the ADF needs to be prepared to undertake—for example 'contributing to the security of our immediate neighbourhood'. Using this as a basis, Defence develops what is called *Australia's Military Strategy* which includes for each strategic task a series of *Military Response Options* which define the broad operational objectives without specifying how they are to be accomplished—for example 'maintain sea lines of communication to the north of Australia'. These Military Response Options then form the basis of the annual *Chief of the Defence Force's Preparedness Directive*.

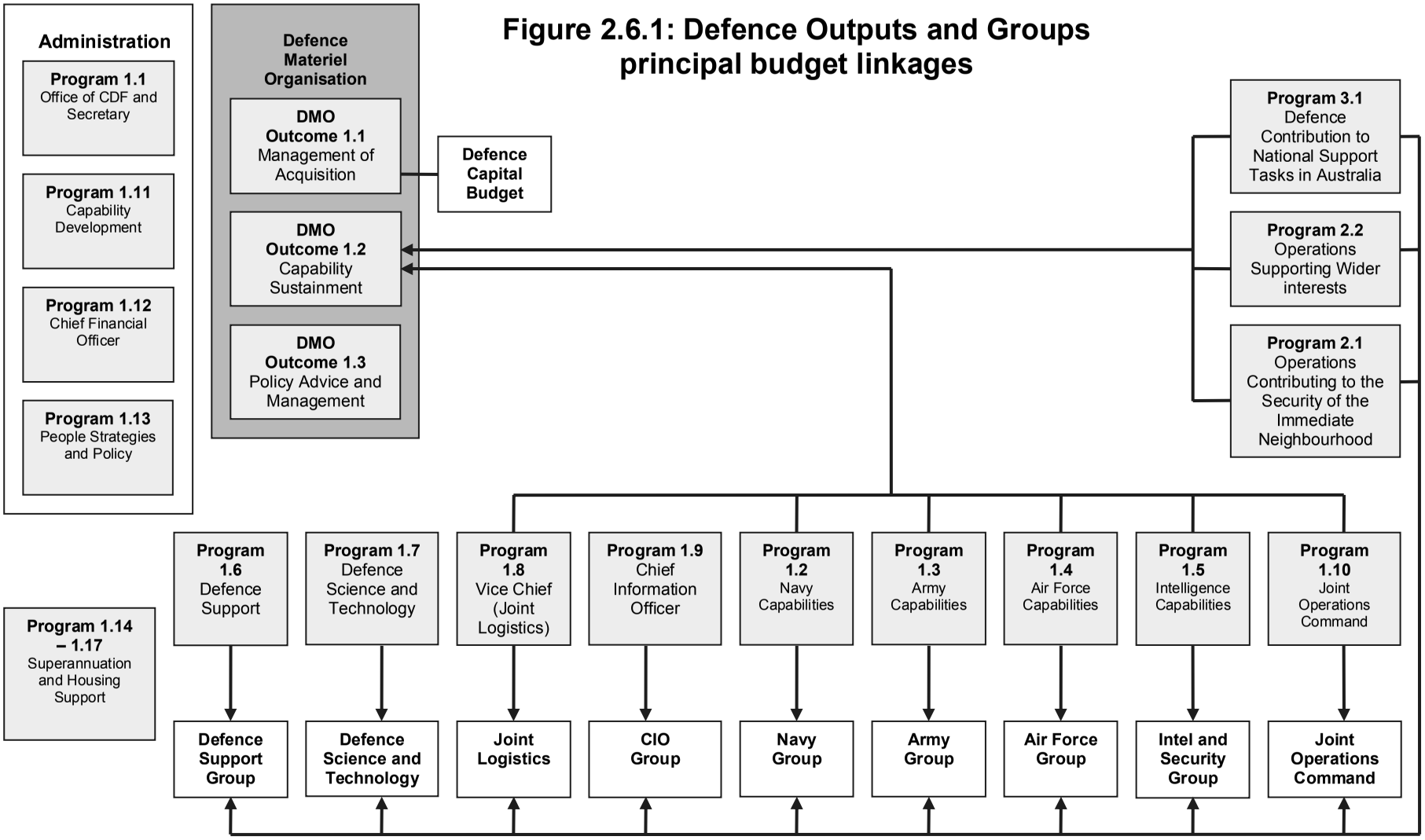
The final result is a series of specific targets for each output. They are classified. But, for example, the light infantry output might be required to 'be prepared to deploy a battalion at 90 days notice to assist in a regional peacekeeping operation and to maintain the deployment for 12 months' (this example is purely illustrative).

Core Skills Preparedness targets are driven by Military Response Options with an anticipated warning time of less than 12 months. To take account of possible longer-term tasks and the requirement to retain broad expertise in the three Services, an enduring performance target for the capability programs is to 'achieve a level of training that maintains core skills and professional standards across all warfare areas'. The assessment of what is to be achieved, and whether it has been achieved, is ultimately based on the professional military judgement of the Service Chiefs.

Quantity All of the capability programs include one or more 'quantity' measures that try to capture some aspect of how much capability will be delivered. Each of the three Services uses a different type of measure.

Army: With the exception of Army Aviation, the quantity measure used by Army is the presence of adequate quantities of trained personnel and equipment within an Output. No quantified targets are released publicly. In practice we get a qualitative assessment in the Annual Report.

Figure 2.6.1: Defence Outputs and Groups principal budget linkages



Navy: The basic measure of quantity used by Navy relates in some sense to the availability of ships and their crew to undertake a mission. From 1990-91 to 1998-99 the measure used was the average number of vessels available over the year, from 1999-00 to 2000-01 it was the number of vessel days at Minimum Level of Capability (MLOC) and in 2001-02 it was the numbers of vessel days Fully Mission Capable (FMC). In 2005-06 yet another measure was introduced, the planned number of Unit Ready Days (URD), defined as follows: Unit Ready Days are the number of days that a force element is available for tasking, by the Maritime Commander, within planned readiness requirements. While this looks similar to the previous definition of Fully Mission Capable we're told that it is actually a different measure, and we therefore caution against comparison between the two quantities.

Air Force: The quantity measure used by Air Force and Army Aviation is the number of flying hours undertaken by the Program. These measures have been applied consistently for over a decade and constitute a useful diagnostic tool given the established baseline.

Activity levels

Of all measures employed, flying hours are the only real measure of ADF activity that is disclosed (it would be useful if Navy's steaming-days and Army's track-miles were disclosed as they were in the past).

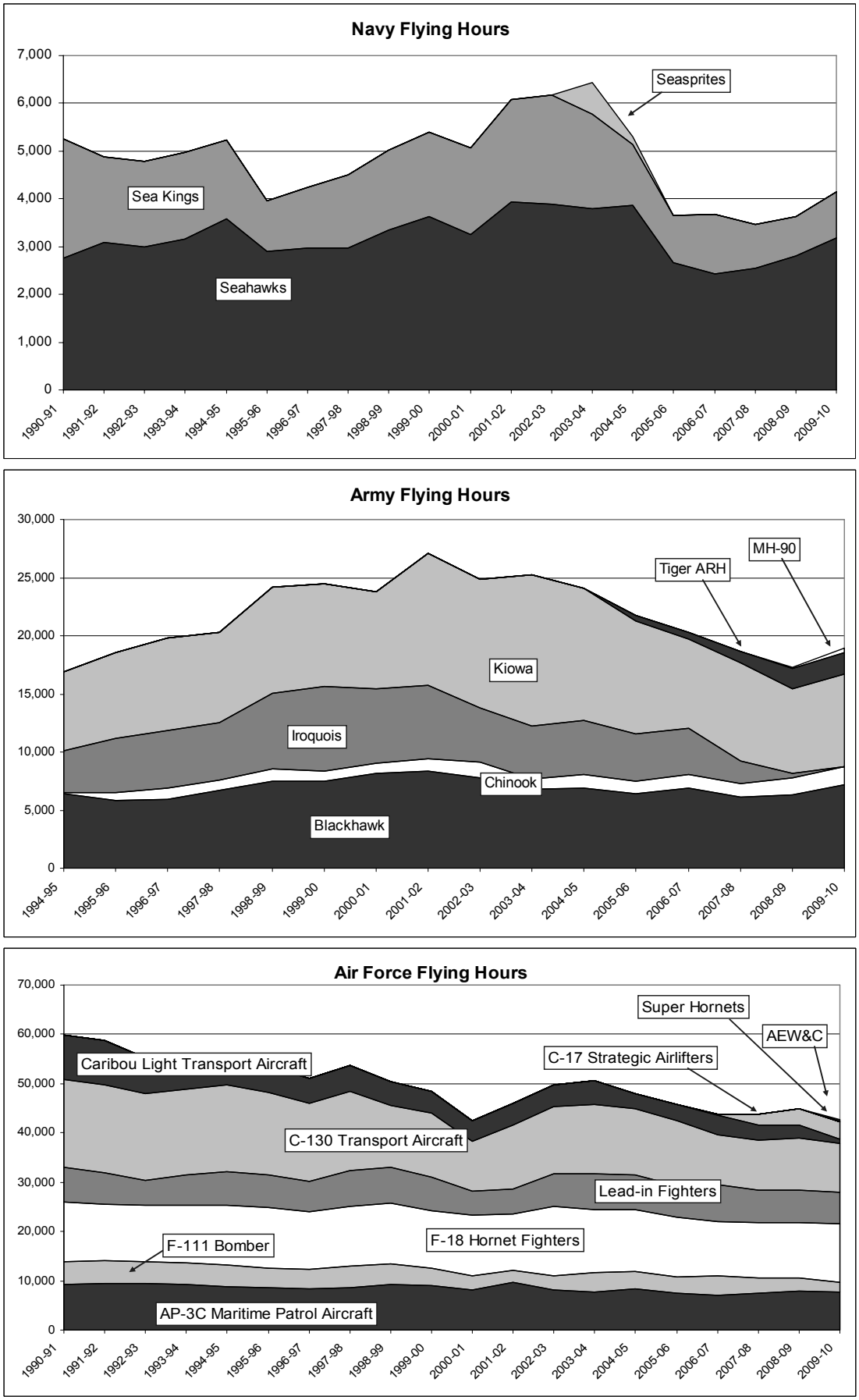
Table 2.6.3 details planned flying hours for key ADF platforms for 2010-11 and 2011-12. Figure 2.6.2 displays the longer-term trends in ADF flying hours.

Table 2.6.3: Planned ADF flying hours 2010-11 and 2011-12

Platform	2010-11	2011-12	Change	Remarks
F-111 bomber	800	-	-	Retired from service in 2010
F/A-18 fighter	13,000	13,000	-	
F/A-18 Super Hornet	2,100	4,800	128%	Entering service
C-130 transport	10,550	10,550	-	
AP-3C Orion	7,900	7,900	-	
C-17 transport	4,000	4,500	12.50%	Entering service
Hawk Lead in fighter	8,000	7,500	-6.20%	
AEW&C	2,000	2,600	30%	Entering service
Chinook helicopter	1,570	1,570	-	
Black Hawk helicopter	8,600	8,600	-	
Kiowa helicopter	7,360	9,360	27%	Aircraft ungraded in 2010-11
Armed recon helicopter	4,150	6,635	60%	Entering service
MRH-90 helicopter	1,500	3,000	100%	Entering service
Seahawk helicopter	3,600	4,200	17%	
Sea King helicopter	1,100	400	-64%	Leaving service

Source: 2011-12 PBS

Figure 2.6.2: Long-term trends in ADF flying hours



Source: Defence Annual Reports

Recent Performance

Table 2.6.4 summarises the non-quantity key performance indicators from the 2009-10 Annual Report. Defence uses a four-point performance scale of zero, one, two or three ticks (✓). This replaces the earlier system of 'not achieved', partially achieved', 'substantially achieved' and 'fully achieved'. The 'overall' assessment in Table 2.6.4 is the percentage of ticks received out of those possible for all performance indicators. The arrows indicate movement relative to previous year result.

Table 2.6.4: Output Performance from the 2009-10 Defence Annual Report

Output	Advice	Preparedness	Core Skills	Overall
1.1 CDF Secretary	✓✓✓			67% ↓
1.2 Navy	✓✓✓ ↑	✓✓	✓✓	67%
1.3 Army	✓✓✓	✓✓✓ ↑	✓✓✓	94% ↑
1.4 Air Force	✓✓✓	✓✓✓	✓✓✓	100%
1.5 Intelligence	✓✓✓			100%
1.6 Defence Support	✓✓✓			92% ↓
1.7 Science & Technology	✓✓ ↑			93% ↓
1.8 Chief Information Officer	✓✓✓			100% ↑
1.9 VCDF	✓✓✓			100%
1.10 Joint Operations Command				100%
1.11 Capability Development	✓✓			83% ↓
1.12 CFO	✓✓✓			83%
1.13 People Strategies & Policy	✓✓✓			63% ↓
2.1 Operations - neighbourhood				100%
2.2 Operations - wider interests				100%
3.0 National Tasks				100%

Source: 2009-10 DAR

Table 2.6.5 shows the planned and actual key performance indicators for quantity (URD and flying hours) for the major platforms operated by the three services. The results have been rated on the four-level scheme as follows; above 95% =✓✓✓, 95% to 75% =✓✓, below 75% =✓. Note that Navy drastically reduced the information it discloses in 2009-10, presumably to avoid scrutiny and accountability.

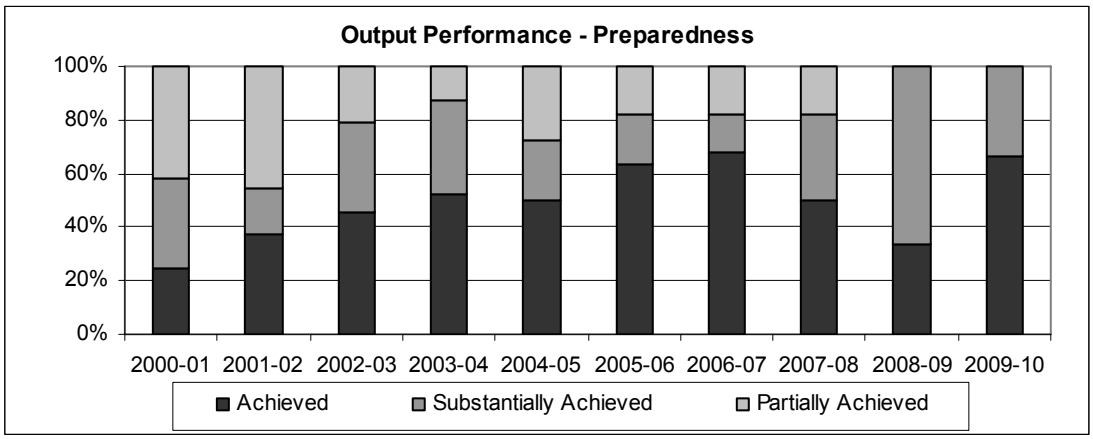
Table 2.6.5: Capability quantity planned (PBS) and delivered (Annual Report) 2009-10

Output	Planned	Reported	Percentage	Assessment
Navy fleets				
Frigates (FFG)	1,025 days	3,649 days	90%	✓✓
Frigates (FFH)	2,166 days			
Submarines	916 days			
Oil Tanker	306 days	3,251 days	97%	✓✓✓
Replenishment Ship	243 days			
Amphibious Ships	640 days			
Heavy Landing Ship	249 days			
Landing Craft Heavy	1,907 days			
Coastal Mine Hunters	2,020 days	5,962 days	95%	✓✓✓
Auxiliary Mine Sweepers	730 days			
Patrol Boats	3,500 days			
Clearance Diver Teams	730 days	1820 days	100%	✓✓✓
Mobile Met Team	730 days			
Geospatial Team	360 days			
Hydrographic Ships	673 days	2,590 days	98%	✓✓✓
Survey Motor Launches	981 days			
Met Centre/Support	730days			
Seahawks	3,400 hours	3,179 hours	94%	✓✓
Sea Kings	1,100 hours	972 hours	88%	✓✓
Army fleets				
Black Hawk	8,600 hours	8,134 hours	94.6%	✓✓
Chinook	1,570 hours	1,563 hours	99.5%	✓✓✓
Kiowa	6,750 hours	6,922 hours	101%	✓✓✓
Armed Recon	6,000 hours	1,798 hours	33%	✓
MH-90	2,820 hours	436 hours	15%	✓
Air Force fleets				
F-111	2,700 hours	1,904 hours	71%	✓
F/A-18 Hornets	12,000 hours	11,997 hours	100%	✓✓✓
F/A-18 Super Hornet	900 hours	407 hours	45%	✓
Lead-in fighter	8,000 hours	6,429 hours	80%	✓✓
KC-30A (refuelling)	800 hours	0 hours	0%	✓
C-130 transports	10,550 hours	9,808 hours	93%	✓✓
AEW&C	500 hours	121 hours	24%	✓
Caribou	2,100 hours	991 hours	47%	✓
C-17 Transports	4,000 hours	3,382 hours	84.5%	✓✓
AP-3C Maritime Patrol	7,900 hours	6,687 hours	97%	✓✓✓
B737 BJ VIP Transport	1,414 hours	1,551 hours	110%	✓✓✓

Source: 2009-10 PBS and Annual Report

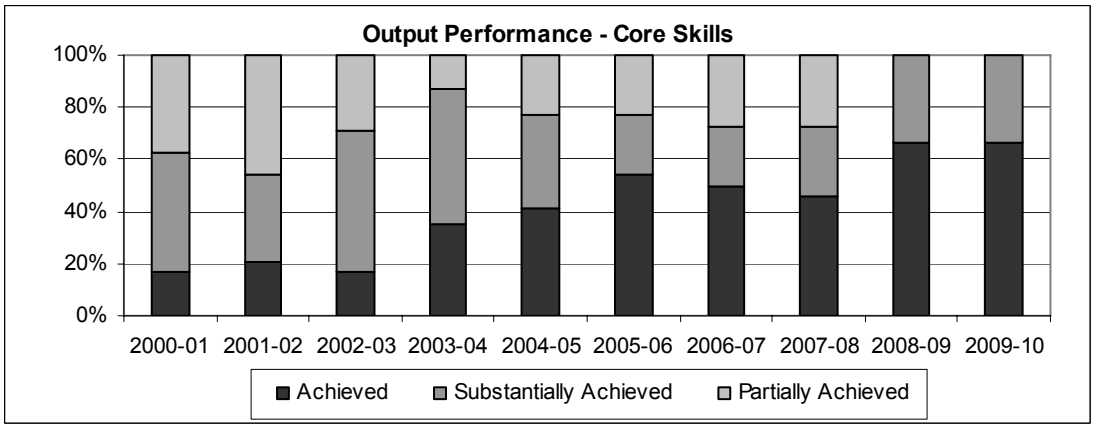
Figures 2.6.3 to 2.6.5 plot the delivery of Defence capability programs (previously outputs) as reported in the Defence annual reports between 2000-01 and 2008-09. Some care needs to be exercised in comparing the results from 2008-09 onwards with that from earlier years due to the substantial reduction in detail that arose in that year. The move from twenty-two capability sub-programs to a mere three (one for each Service) inevitably results in a reporting regime constrained to a smaller number of possible outcomes for preparedness and core skills.

Figure 2.6.3: Output performance – preparedness



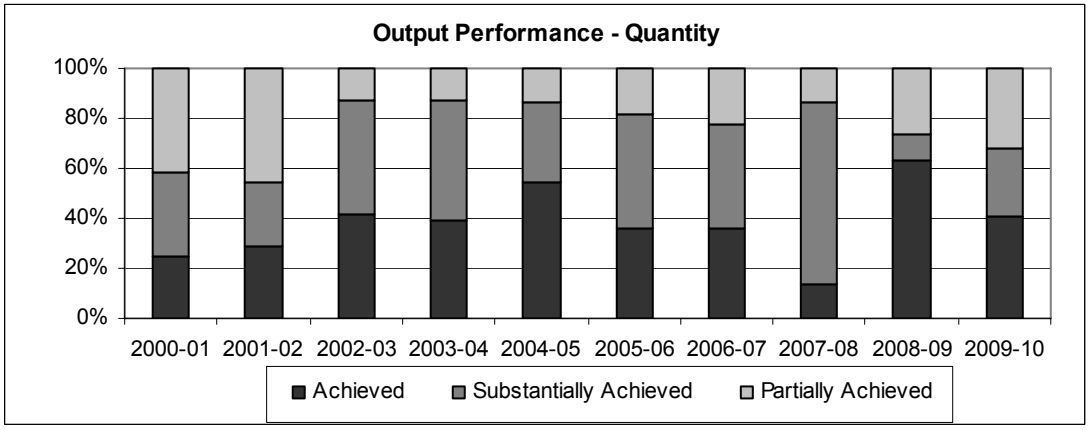
Source: 2000-01 to 2009-10 DAR

Figure 2.6.4: Output performance – core skills



Source: 2000-01 to 2009-10 DAR

Figure 2.6.5: Output performance – quantity



Source: 2000-01 to 2009-10 DAR

Program Summaries

To augment the information provided in the PBS, we have prepared short program summaries containing background and historical performance information. In doing so, we have not sought to reproduce the material in the PBS but to complement it. Given the acute paucity of information provided in the PBS on what is to be delivered at the sub-program level, only a limited picture is possible. Information has been drawn from a variety of sources, including the Defence website.

Because the recently adopted program structure aligns closely with the actual organisational structure of Defence, we have taken the opportunity to sketch out the key elements in each of the programs. For those readers not familiar with the senior military and civilian levels, Table 2.6.6 details the correspondence of executive levels across the three services and civilian Senior Executive Service (SES).

Table 2.6.6: Executive comparison:

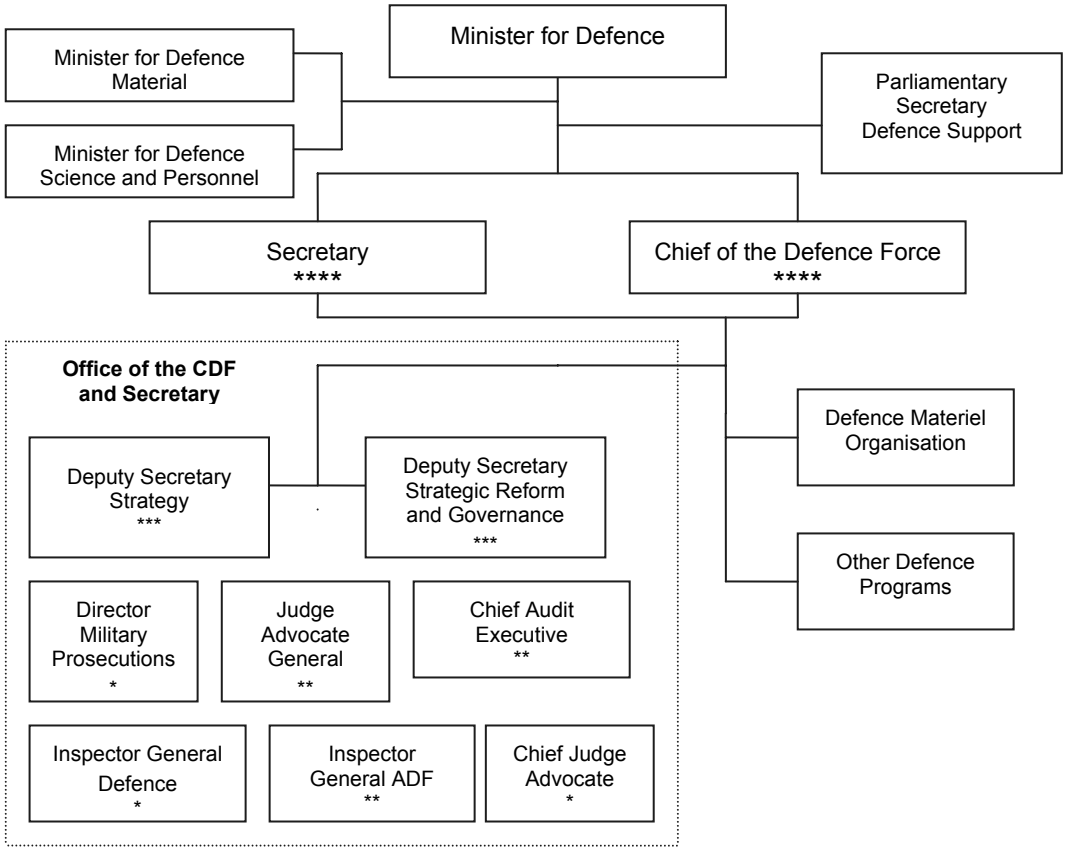
Civilian	Navy	Army	Air Force	Star Rank
Assistant Secretary (SES-1)	Commodore	Brigade	Air Commodore	*
First Assistant Secretary (SES-2)	Rear Admiral	Major General	Air Vice-Marshal	**
Deputy Secretary (SES-3)	Vice Admiral	Lt General	Air Marshall	***
Secretary	Admiral	General	Chief Air Marshal	****

Program 1.1 – Office of the Secretary and CDF

Department outputs 2011-12: $173 million

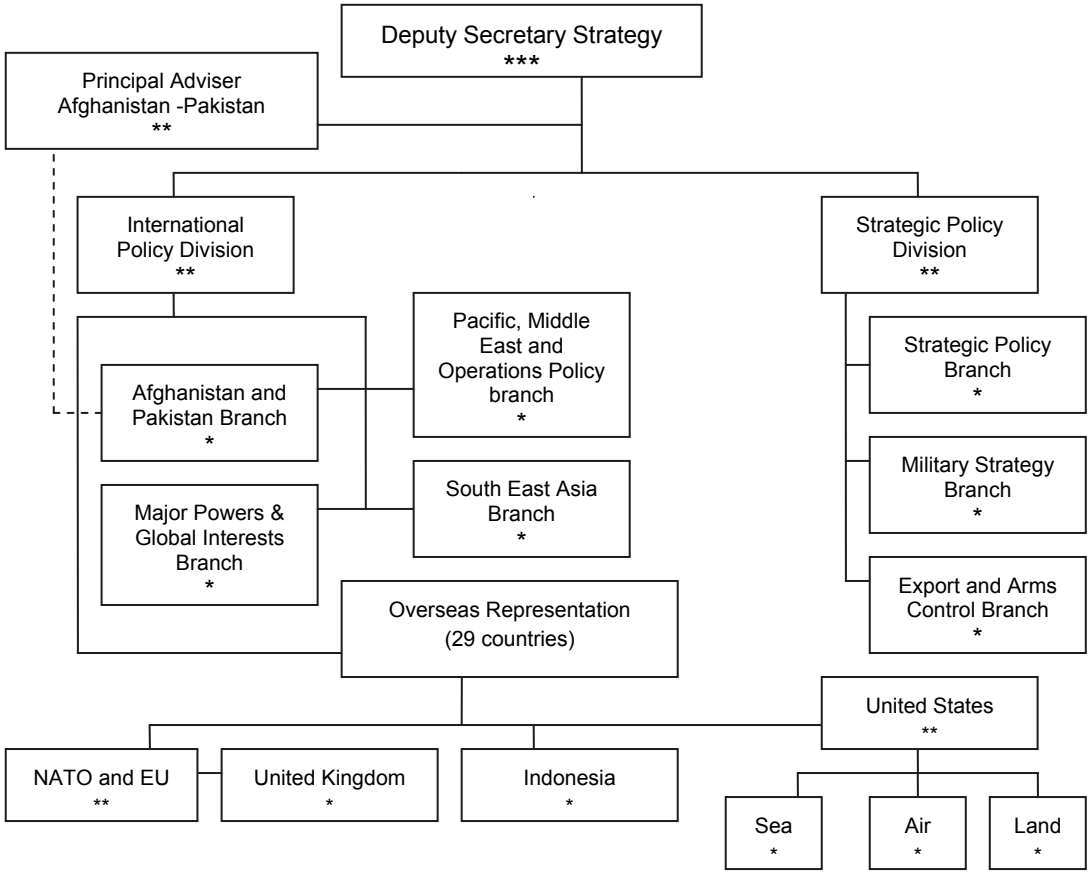
The Office of the Secretary and CDF was created as a result of the 2007 Defence Management Review. It combines two central policy organisations led by deputy secretaries—Strategy and Strategic Reform and Governance, and the Chief Audit Executive led by a First Assistant Secretary. The Office of the Secretary and CDF has two Deputy Secretaries, five First Assistant Secretary / Major General equivalents and eighteen Assistant Secretary / Brigadier equivalents (many of which are Defence Attaché's serving in Australian Embassy's overseas).

Within the Defence portfolio there are a number of independent military justice statutory offices. The offices the Judge Advocate General, the Chief Judge Advocate, the Director of Military Prosecutions and the Registrar of Military Justice are created by the *Defence Force Discipline Act 1982*. Each of these statutory appointments reports directly to the Minister for Defence. The Inspector General of the ADF is a statutory appointment created by the *Defence Act 1903* which reports directly to the CDF outside of the military chain of command.

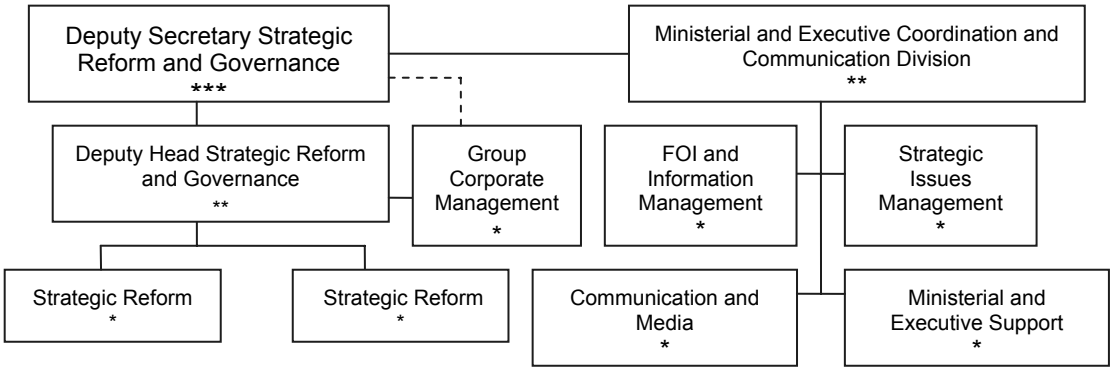


Deputy Secretary Strategy manages two divisions as set out overleaf. International Policy Division manages Defence's day-to-day international relationships and provides policy advice in that area. Responsibilities include oversight of Defence's overseas representatives in 29 countries around the world (mostly within Australian diplomatic missions). Strategic Policy Division provides advice on strategic plans and military strategy, while also managing Australia's arms export controls. Group Corporate Management provides corporate management services to the whole of OSCDF Group. In addition, Principal Adviser Afghanistan-Pakistan reports to

Deputy Secretary Strategy, acting as a special advisor on policy issues related to operations in Afghanistan, and Australia's defence engagement with Pakistan.



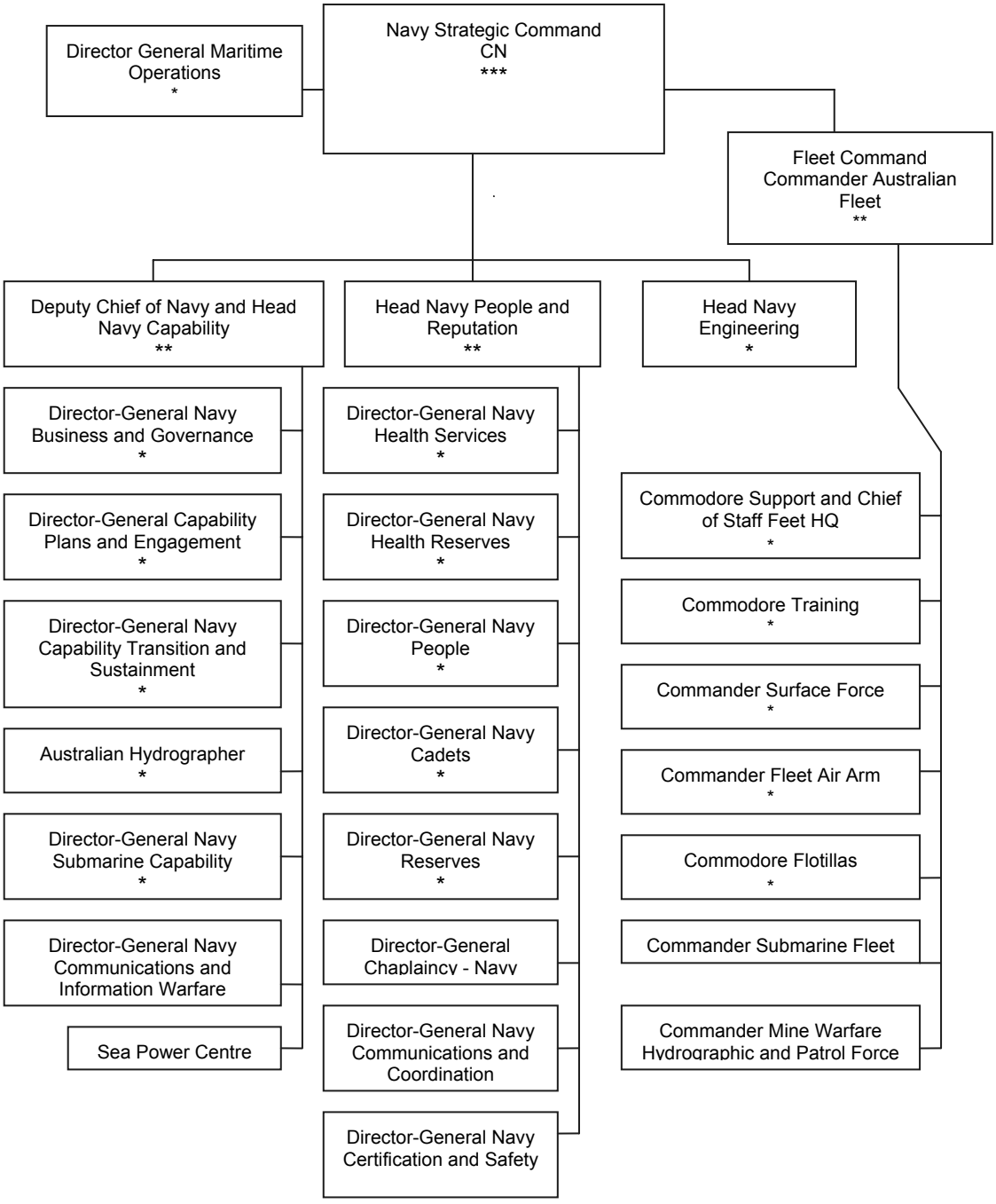
Deputy Secretary Strategic Reform and Governance is responsible for oversighting the Strategic Reform Program and its accompanying decade-long $20.6 billion savings program. With effect from 4 May 2011, Deputy Secretary SRG also assumed responsibility for Ministerial and Executive Coordination and Communication Division. The division is responsible for providing support to Ministers and senior Defence leaders in the areas of communication and media; strategic issues management, Freedom of Information-related matters, and the full range of Ministerial support services. Note that there was also an organisation established at the Deputy Secretary level in DMO and at the First Assistant Secretary level in Defence Support Group (since disbanded) to further oversight the Strategic Reform Program.



Program 1.2 – Navy Capabilities

Department outputs 2011-12: $4,052 million

The Navy's organisational structure comprises Navy Strategic Command and the subordinate Fleet Command. To a good approximation, Strategic Command is responsible for capability plans, personnel, administration and technical regulation, while Fleet Command is responsible for the day-to-day operation of the fleet.



Structure and performance

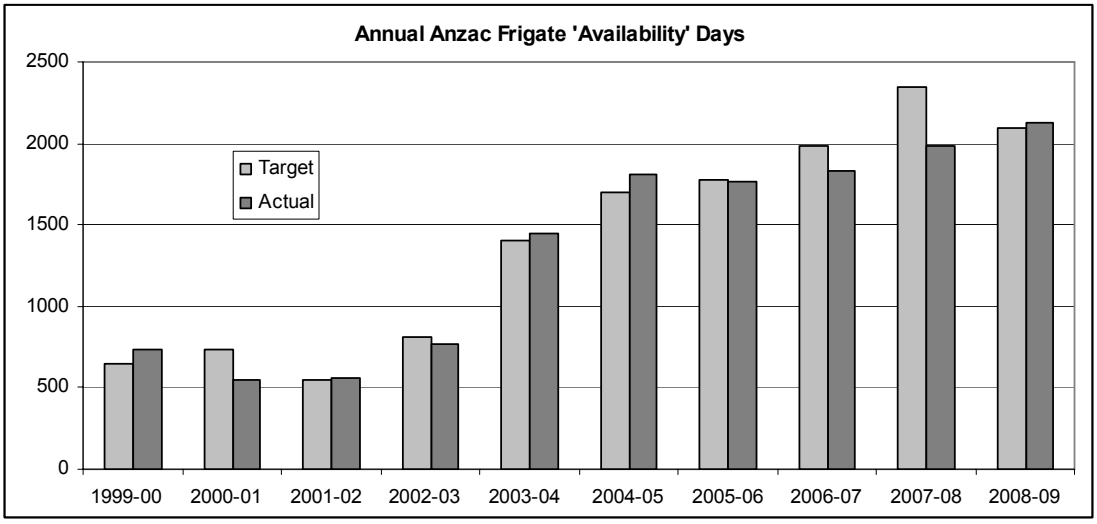
The structure and performance of the Navy is set out overleaf. Because of the reduction in disclosure, it has not been possible to update the availability rates for individual fleets.

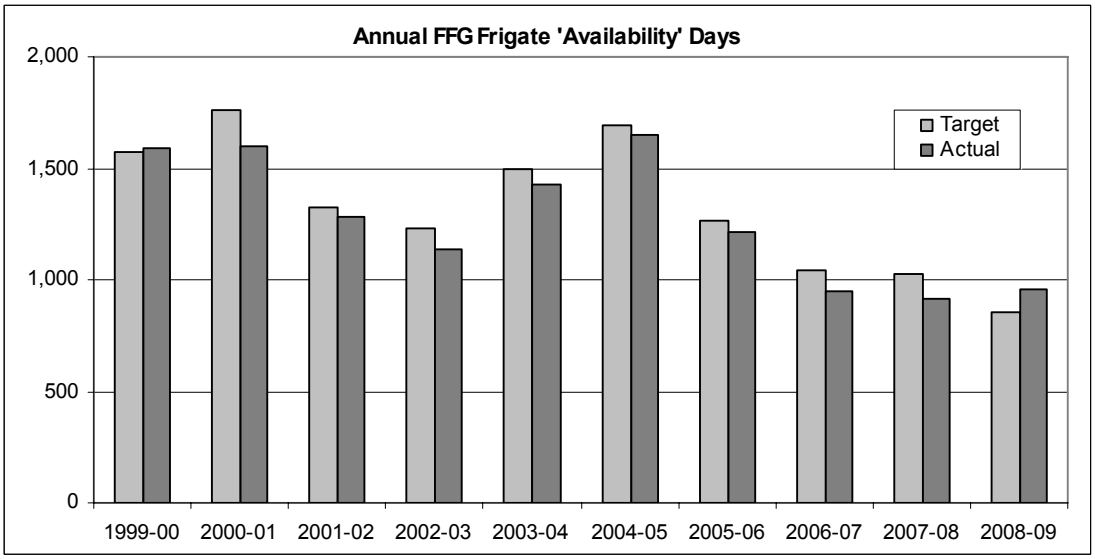
Surface combatant fleet

Four 1980s *Adelaide* class (US Oliver Hazard Perry class) Guided missile frigates (FFG) plus eight newer German-designed and Australian-built *Anzac* class frigates (FFH). Both vessels carry *Harpoon* anti-shipping missiles, anti-submarine torpedoes and Evolved *Sea Sparrow* surface-to-air missiles. Only the FFG are equipped with the more capable *Standard* SM-2 surface-to-air missile

The *Anzac* class have a 5" gun useful for shore bombardment (as seen in the Gulf in 2003) while the FFG has a less capable 3" gun. Both classes of vessel can embark a *Seahawk* anti-submarine helicopter, although the recent availability and current capability of these aircraft is less than desired.

Upgrades are underway on both fleets. The FFG is nearing completion of the long-delayed $1.4 billion FFG-upgrade project and the FFH are progressively being fitted with a range of new systems including an anti-ship missile defence (ASMD) suite. In addition, three new Air Warfare Destroyers are presently under construction.





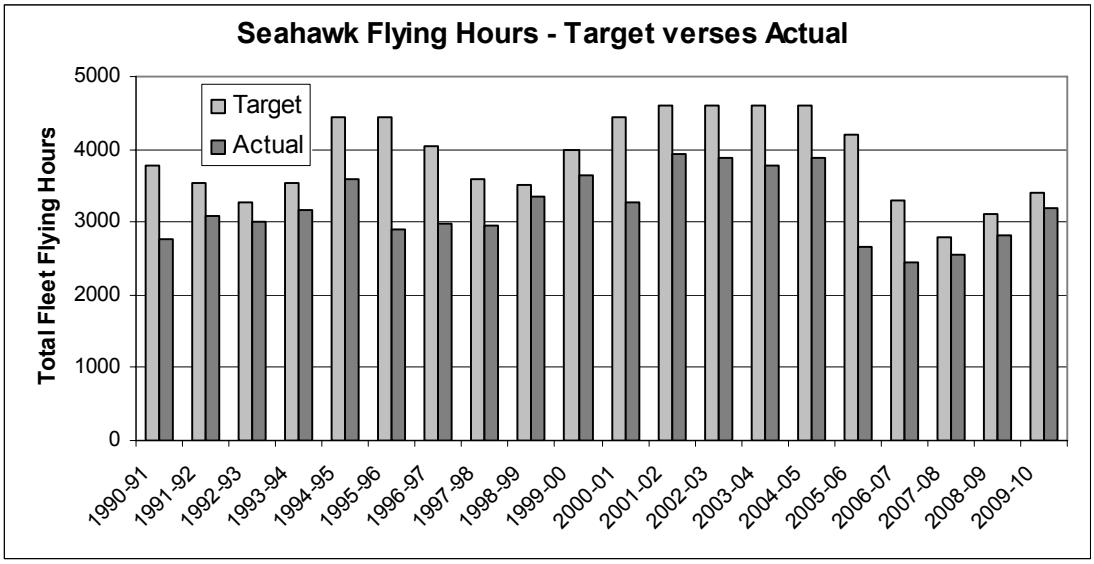
Units of measure:
1999-00 to 2000-01; 'Minimum level of capability days'
2001-02 to 2003-04; 'Fully mission capable days'
2004-05 to present; 'Unit ready days'

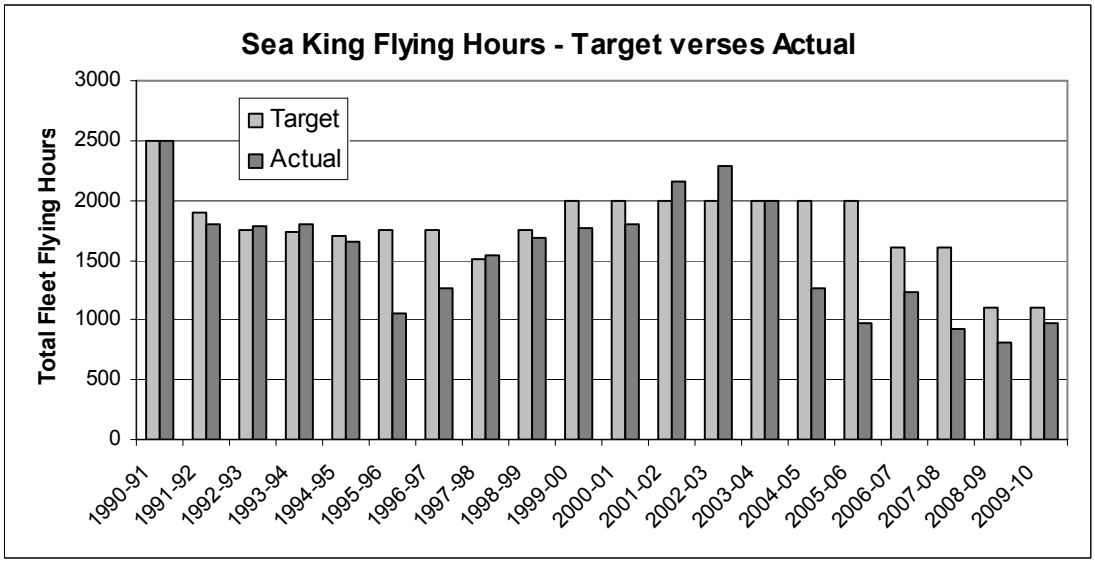
Naval aviation

The RAN has sixteen 1980s US-designed *Seahawk* helicopters that can be embarked on the FFH and FFG class frigates. They are configured for anti-submarine and surface search/targeting. A project to deliver eleven *Super-Seasprite* helicopters for the *Anzac* frigates was cancelled in early 2008. The Future Naval Aviation System will replace both the *Seahawk* and the capability sought be the *Super-Seasprite* from 2014.

There are also six 1970's UK-built *Sea King* helicopters used for troop lift and logistics tasks that will be replaced by six MRH-90 aircraft from late 2011. Thirteen *Squirrel* light helicopters are used for training and short-term operations at sea. Navy leases three Agusta Westland A109E aircraft for training and general duties.

In recent years, the performance of both the *Sea King* and *Seahawk* fleets has been compromised by personnel shortages, maintenance issues and ongoing aircraft upgrades and modifications.

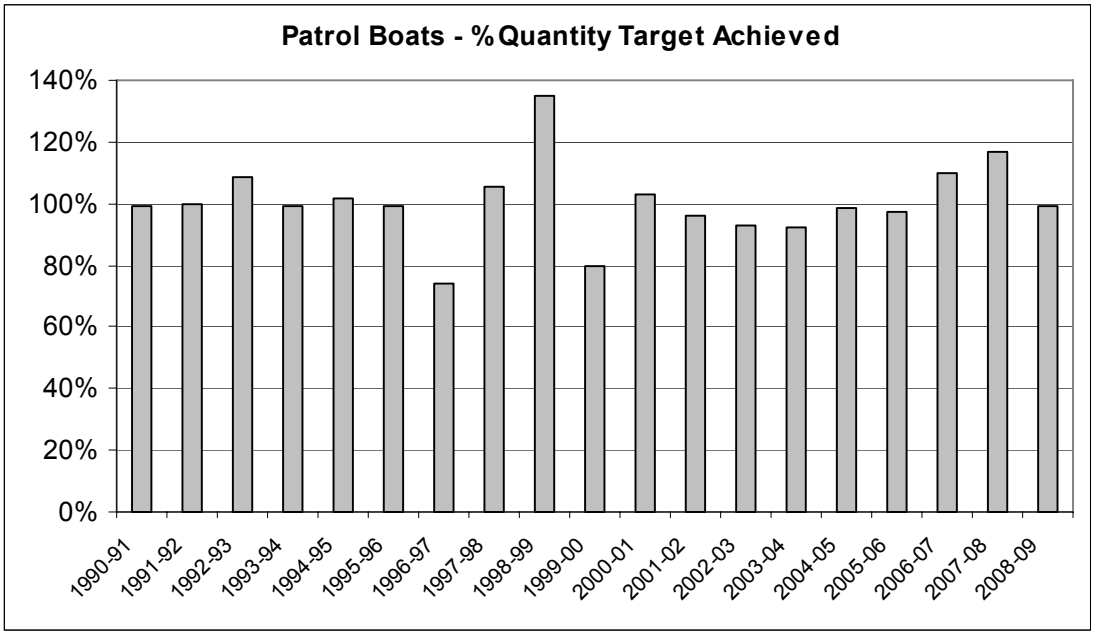




Patrol boat fleet

All of Navy's fleet of fifteen 1980s vintage Australian-built, UK-designed, *Fremantle* Class Patrol Boats (FCPB) have now been replaced by fourteen *Armidale* Class Patrol Boat (ACPB). These vessels are mainly tasked in support of the civil surveillance program through Border Protection Command. They can also be used for the insertion and extraction of army patrols on the coast, including Special Forces.

Through an innovative program, the Navy multi-crews the *Armidale* Class vessels, thereby reducing the burden on sailors and their families while maintaining a high utilisation of the assets. At present there are 21 crews spread across 14 vessels.



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

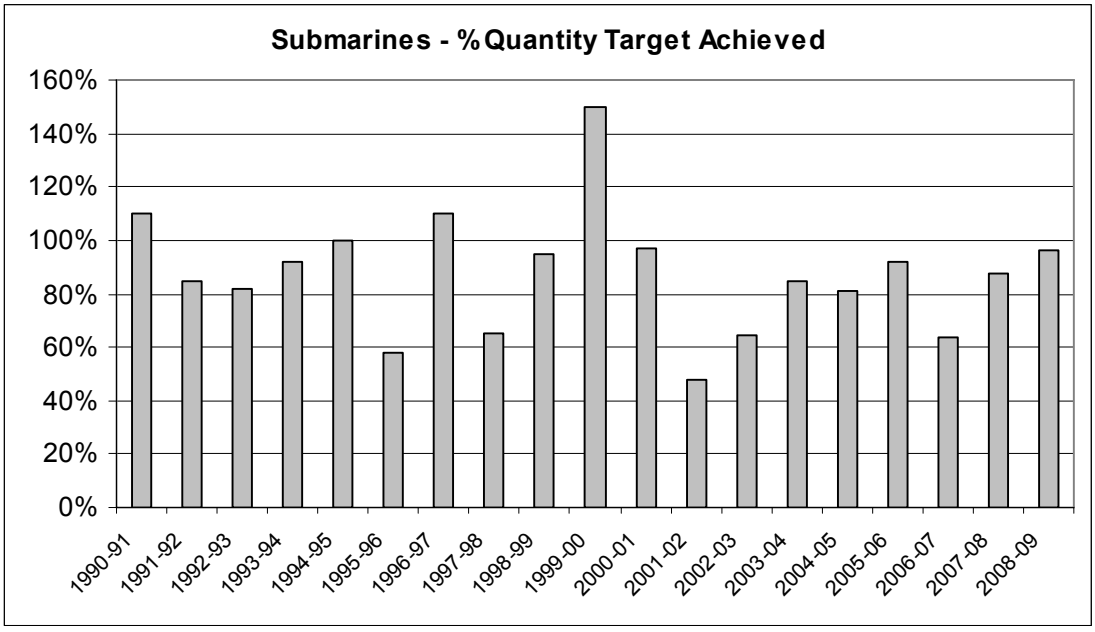
Submarine fleet

The RAN has six *Collins* Class submarines. Their primary roles are to attack enemy shipping and to counter the threat of adversary submarines. In addition, they can collect intelligence and insert and extract Special Forces. The *Collins* Class is equipped with *Harpoon* anti-ship missiles and the US Mk 48 heavyweight torpedo.

The delay in the introduction of the *Collins* Class into service as the *Oberon* Class left service disrupted both submariner training and the retention of skilled personnel. This is now being corrected through a remediation program.

A shortage of submariners has reduced the delivery of capability. Personnel shortages were so acute that submarines were tied up or put into maintenance early. Longer than expected maintenance periods coupled with mechanical problems further compromised the availability of boats. However, Navy has been successful in growing the numbers of trained submariners, and submarine platform availability is also improving.

Notwithstanding the many trials and tribulations that have arisen with the locally-built *Collins* fleet, the 2009 Defence White Paper outlines plans for an even more ambitious indigenous replacement program.

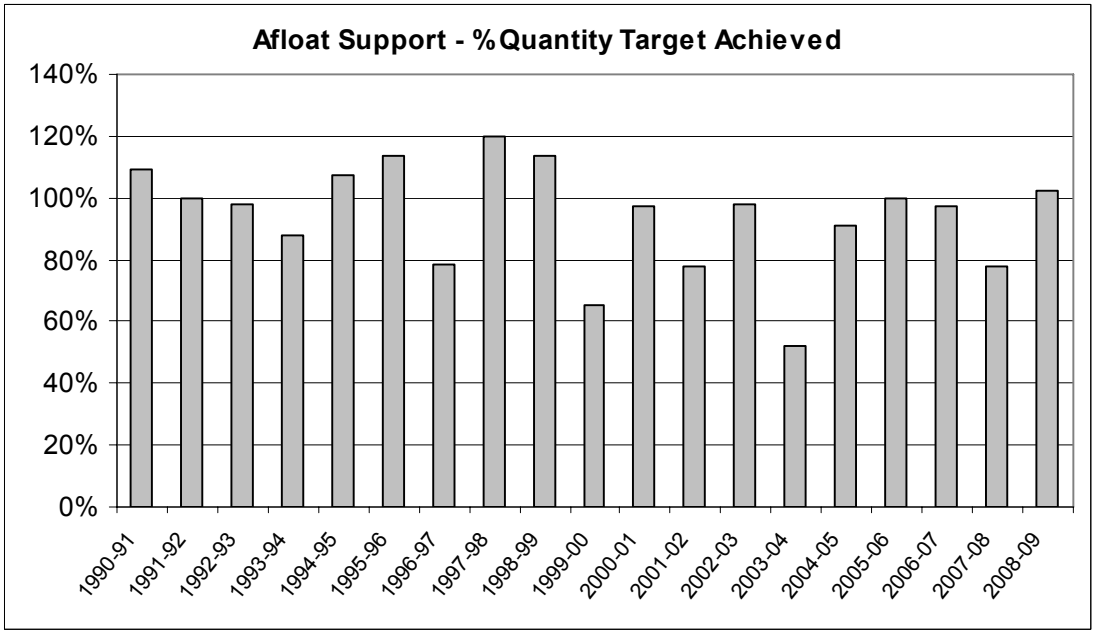


Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Afloat support fleet

The afloat support force refuels and re-supplies Navy vessels and embarked helicopters at sea and provides logistics support to land operations. The fleet comprises two vessels: HMAS *Sirius:* a South Korean-built 46,017 tonne full displacement commercial vessel which was refitted to Navy specifications as an Auxiliary Tanker (AO). HMAS *Success:* a 1980s French-designed, Australian-built 17,900 tonnes full displacement Auxiliary Replenishment Tanker (AOR).

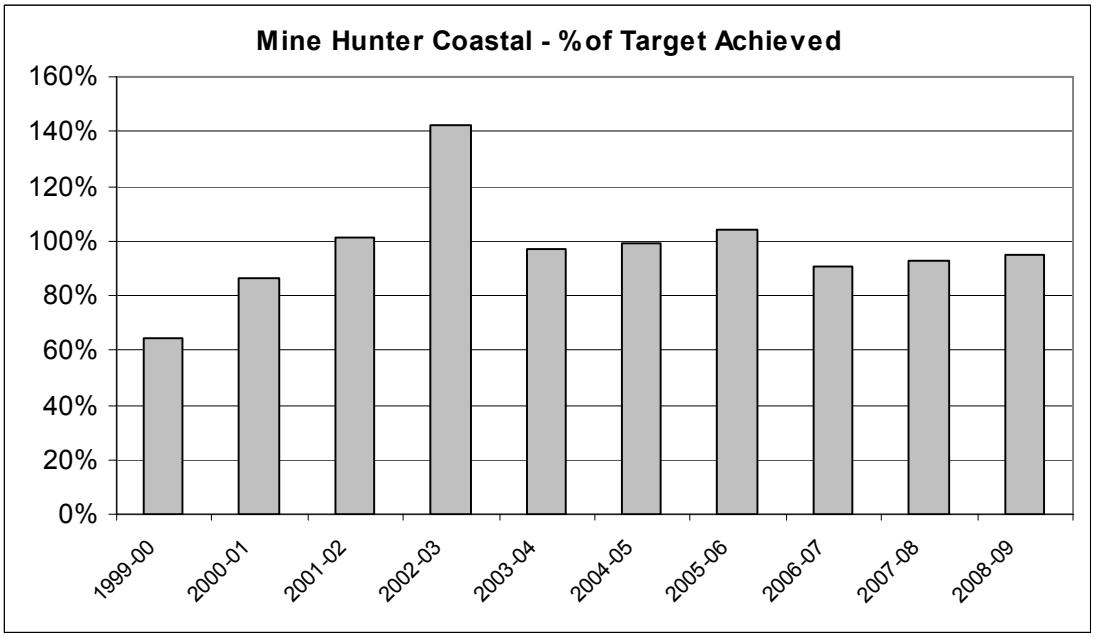
Although HMAS *Sirius* has been touted as an example of how commercial-off-the-shelf equipment can meet ADF requirements quickly and at reduced cost, the ship does not have the full range of capabilities and operational flexibility of a purpose build ship such as *Success.*



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Mine warfare fleet

6 *Huon* Class Coastal Mine Hunters (MHC) – 720 tonnes displacement, glass-reinforced plastic hulled, Italian-designed and built in Australia in the late 1990's. The ships employ sonar to search for mines, which can then be destroyed using a remote controlled mine disposal vehicle or otherwise. Two Clearance Diving Teams, one on each coast at Sydney and Perth, capable of clearing mines and other ordinance, clandestine survey and obstacle clearance, and submerged battle damage repairs.

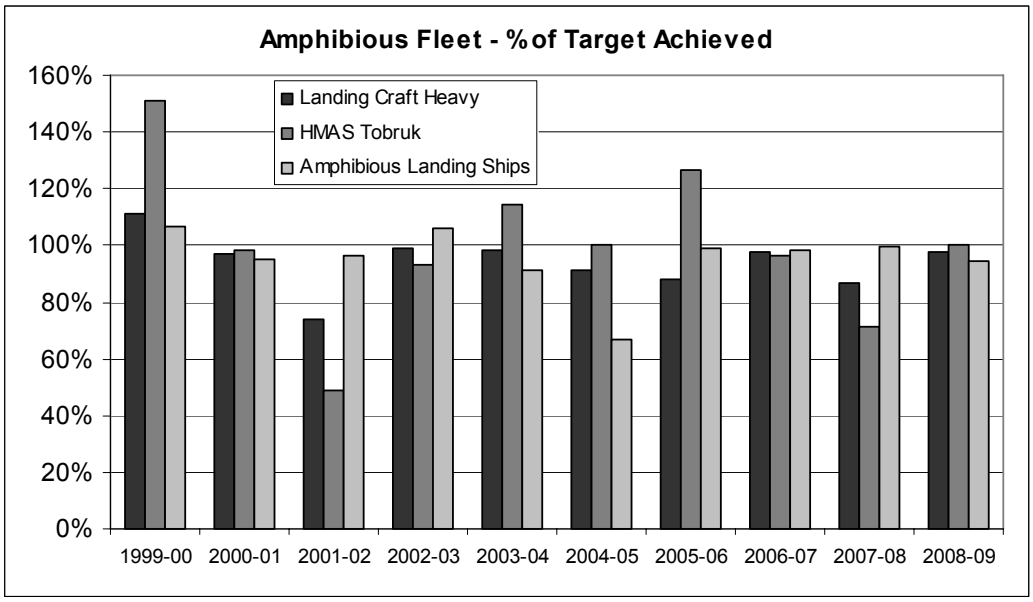


Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Amphibious lift fleet

Until recently, the fleet included two *Kanimbla* Class Landing Platforms Amphibious (LPA), HMAS *Manoora* and HMAS *Kanimbla,* refurbished in the mid-to-late 1990's from two second-hand 1970's US *Newport* Class Landing Ship Tank vessels, and one Heavy Landing Ship (HLS), HMAS *Tobruk*, a 1980's UK-designed and Australian-built vessel. *Tobruk* displaces 5,800 tonnes and can operate any ADF helicopter from her deck and is capable of carrying 315 soldiers, 18 tanks and 40 armoured personnel carriers. The LPA displace 8,450 tonnes and can carry 450 troops along with vehicles and landing craft. In addition, they have been fitted with medical and command and control facilities, and have the ability to house up to four troop-lift helicopters.

In February 2011 the amphibious fleet suffered a critical and unexpected failure of availability. Current plans are for HMAS *Manoora* to be decommissioned while HMAS *Kanimbla* will be unavailable for an extended period due to ongoing maintenance. Amphibious heavy lift capability will be maintained through the acquisition of a second-hand vessel (RFA Largs Bay) from the United Kingdom. Two new large amphibious (Landing Helicopter Dock) vessels are under construction and are due to enter service in the first half of the decade. These vessels will each displace around 26,000 tonnes and carry 1,000 troops plus helicopters and vehicles. Navy also has six Landing Craft Heavy (LCH).



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

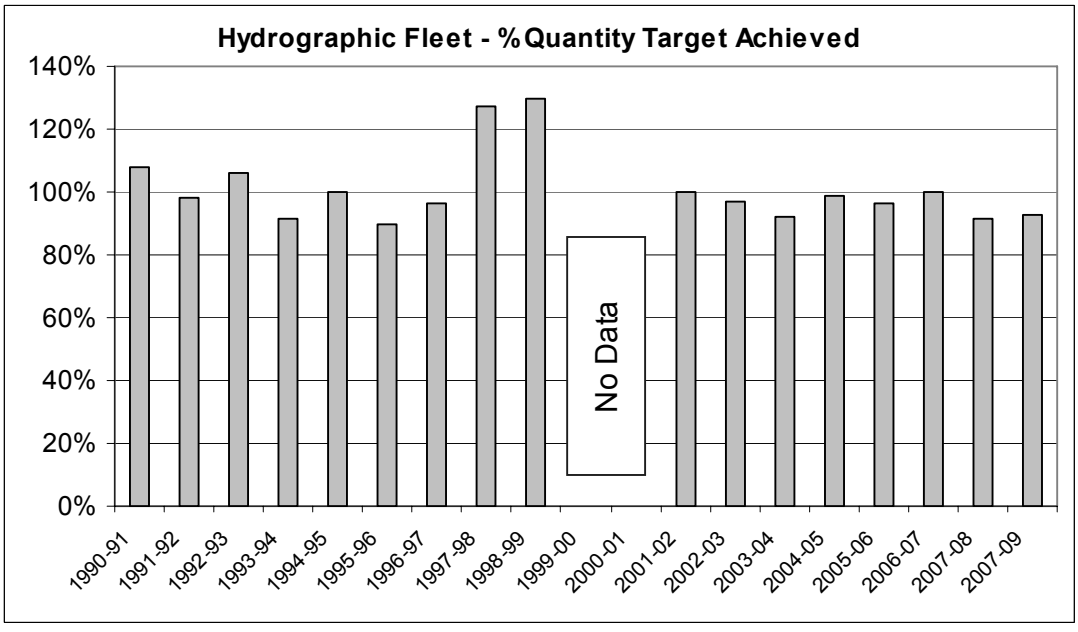
Hydrographic, metrological & oceanographic fleet

The Navy produces maritime military geospatial information for the ADF and undertakes hydrographic surveying and charting for civil use. The hydrographic component is supported by the Australian Hydrographic Office in Wollongong, NSW, and also comprises the Hydrographic Office deployable survey unit. The fleet includes;

2 *Leeuwin* Class Hydrographic Ships (AGHS): 2,250 tonne Australian-built hydrographic ships.

4 *Paluma* Class Survey Motor Launches (SML)*:* 320 tonne Australian-built survey launches.

1 Laser Airborne Depth Sounder (LADS) aircraft: an airborne depth sounder capability used in shallow water.



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Program 1.3 – Army Capabilities

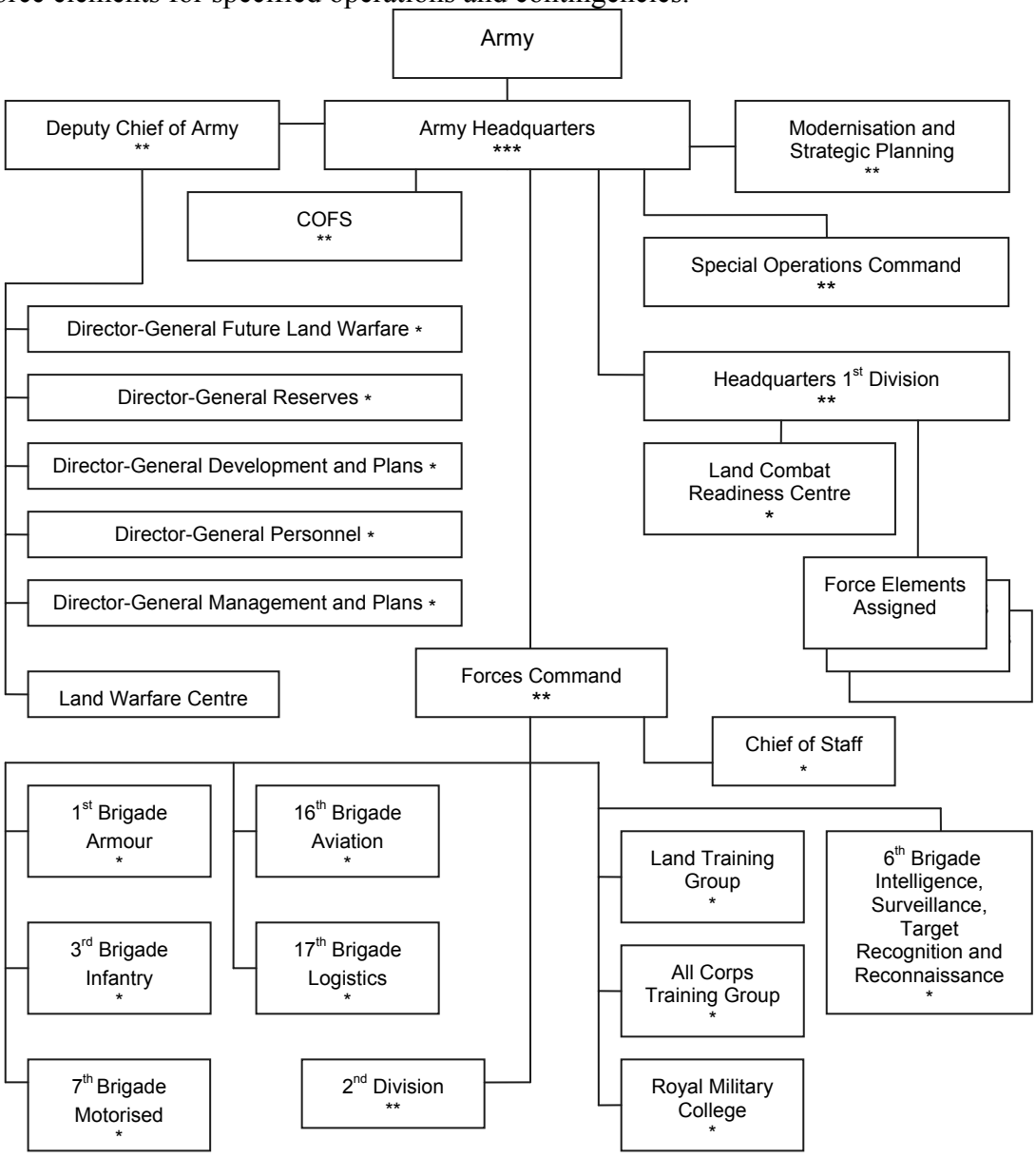
Department outputs 2011-12: $4,927 million

In 2009, the Australian Army was restructured to ensure it is more effective and efficient in its conduct of force generation and force preparation - for current operations and potential operations of the future. The Army was structured around three functional commands. The three functional commands and their roles are as follows:

Special Operations Command commanding Army's Special Forces units

Forces Command is *responsible* for the force generation of Army individual and collective conventional capabilities based on Foundation Warfighting skills.

Headquarters 1st Division focuses on the force preparation of conventional Army force elements for specified operations and contingencies.



HEADQUARTERS 1ST DIVISION

Headquarters 1st Division is based in Brisbane, and prepares and certifies Army conventional force elements, as assigned by Chief of Army, in order to meet the specific operational and contingency requirements directed by Chief Joint Operations.

SPECIAL OPERATIONS COMMAND

The Special Air Services Regiment (SASR) in Western Australia provides special recovery (including domestic and overseas counter terrorism by the west coast Tactical Assault Group (TAG)), long-range reconnaissance and offensive operations. The 2nd Commando Regiment (2 Cdo Regt) in Sydney (including east coast TAG) and the 1st Commando Regiment (a reserve unit split between Sydney and Melbourne) are the Army's two commando regiments. Commando roles include special recovery and land, sea- and air-borne offensive raids. The 126 Signals Squadron in Sydney provides a Special Forces signals capability to 2 Cdo Regt and 152 Signals Squadron in Perth provides a signals capability to the SASR. There is also an Incident Response Regiment based in Sydney that is capable of dealing with nuclear, chemical and biological incidents. In addition, there is a Special Forces Logistics Squadron in Sydney and a Special Forces Training Centre in Singleton.

FORCES COMMAND

1st Brigade

The 1st Brigade is headquartered in Darwin and has units located in both Darwin and Adelaide. The 1st Armoured Regiment is equipped with reconditioned US-made M1A1 *Abrams* tanks. The 2nd Cavalry Regiment is equipped with 1990s North American-designed but Australian modified ASLAV light armoured vehicles. The 5th and 7th Battalions Royal Australian Regiments are mechanised infantry battalions equipped with M113AS4 armoured personnel carriers and Australian-made *Bushmaster* infantry mobility vehicles. The 7th Battalion relocated to Adelaide in 2010. The 8th/12th Regiment (artillery) is equipped with US-made 155mm M198 Medium Howitzers. Additionally, the 1st Brigade includes extensive combat support and combat service support elements including 1st Combat Engineer Regiment, 1st Combat Service Support Battalion and the 1st Communications Support Regiment.

3rd Brigade

The 3rd Brigade headquartered in Townsville is based on three light infantry battalions: the 1st Battalion Royal Australian Regiment, the 2nd Battalion Royal Australian Regiment and the 3rd Battalion Royal Australian Regiment. The 3rd Battalion is a parachute battalion and is located in Sydney and plans to move to Townsville in late 2011. The 4th Regiment (artillery) is equipped with the 105mm L119 Hamel light gun. B Squadron 3rd/4th Cavalry Regiment is equipped with *Bushmaster* infantry mobility vehicles. The Brigade's combat support and combat service support elements include the 3rd Combat Engineer Regiment, 3rd Combat Service Support Battalion and 3rd Communications Support Regiment.

7th Brigade

Motorised operations are based around the 7th Brigade headquartered in Brisbane. The brigade is an integrated-regular formation based in Brisbane. The brigade comprises of two motorised infantry battalions; 6th Battalion Royal Australian Regiment and 8/9th Battalion Royal Australian Regiment and both are equipped with *Bushmaster* infantry mobility vehicles. The 2nd/14th Light Horse Regiment

(Queensland Mounted Infantry) is a Cavalry unit and is equipped with 1990s North American-designed but Australian modified ASLAV light armoured vehicles. The 1st Regiment (artillery) is equipped with the 155mm M777 howitzer. The Brigade's combat support and combat service support elements include the 7th Combat Engineer Regiment, 7th Combat Service Support Battalion and 7th Communications Support Regiment.

6th Brigade

Headquartered at Victoria Barracks in Sydney, the 6th Brigade commands a diverse collection of units including:

- 1st Ground Liaison Group(Australia wide),
- 1st Intelligence Battalion (Sydney),
- 16th Air Defence Regiment (Woodside SA) equipped with the Swedish RBS 70 shoulder launched, optically guided, surface-to-air missiles,
- 19th Chief Engineer Works (Sydney),
- 20th Surveillance and Target Acquisition Regiment (Brisbane),
- 7th Signals Regiment - Electronic Warfare (Carbalah, Queensland),
- 6th Engineer Support Regiment (Brisbane) comprising:
    - 17th Construction Squadron (Sydney),
    - 21st Construction Squadron (Brisbane), and
    - 1st Topographical Survey Squadron (Enoggera, Queensland).
- 2/30th Training Group (Butterworth, Malaysia),

The Brigade also includes three regional surveillance units predominately manned by reserve personnel. These are:

- 51st Battalion Far North Queensland Regiment responsible for conducting reconnaissance and surveillance over 640,000 square km in Far North Queensland and the Gulf country.
- Pilbara Regiment (Karratha, WA) with 1.3 million square km to cover from the Kimberley boundary in the north, to Shark Bay in the south, then east to the NT/SA/WA border.
- North West Mobile Force (NORFORCE) which covers the Northern Territory and the Kimberly region of northern Western Australia, an area of operations covering nearly one quarter of Australia's land mass—1.8 million square kilometres.

17th Brigade

The 17th Brigade, headquartered at Randwick Barracks in Sydney, is a brigade-sized grouping of reserve, integrated and permanent Army units which can sustain a brigade on operations for extended periods while concurrently maintaining a battalion group elsewhere. The Brigade provides supply, fuel, communications, transport (surface vehicle and small watercraft), repair, and health and psychology capabilities. The Brigade is headquartered in Sydney and comprises of the following units:

- 2nd Force Support Battalion (Glenorchy, Tasmania),

- 9th Force Support Battalion (Amberley, Queensland)
- 10th Force Support Battalion (Townsville),
- 1st Health Support Battalion (Sydney),
- 2nd Health Support Battalion (Brisbane),
- 3rd Health Support Battalion (Adelaide),
- 17th Signals Regiment (Sydney),
- 1st Military Police Battalion (Sydney), and
- 1st Psychology Unit (Sydney).

2nd Division

The 2nd Division commands all those Reserve units not integrated into other formations. It is structured around six infantry brigades, each of which has a HQ, two/three infantry battalions, a light cavalry unit in some cases, and combat and combat service support units. These brigades are:

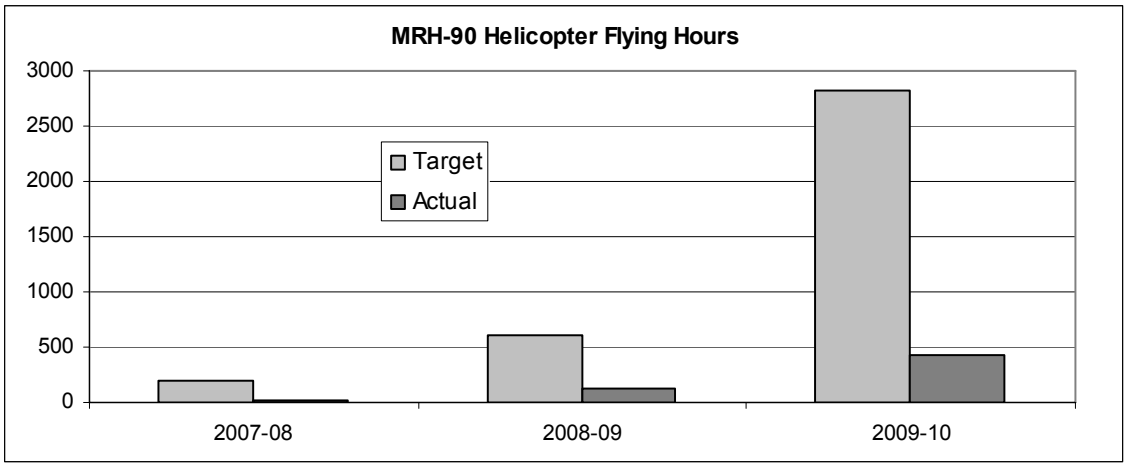
- 4th Brigade (Melbourne),
- 5th Brigades (Sydney),
- 8th Brigade (Sydney),
- 9th Brigade (Adelaide and Hobart),
- 11th Brigade (Townsville), and
- 13th Brigade (Perth).

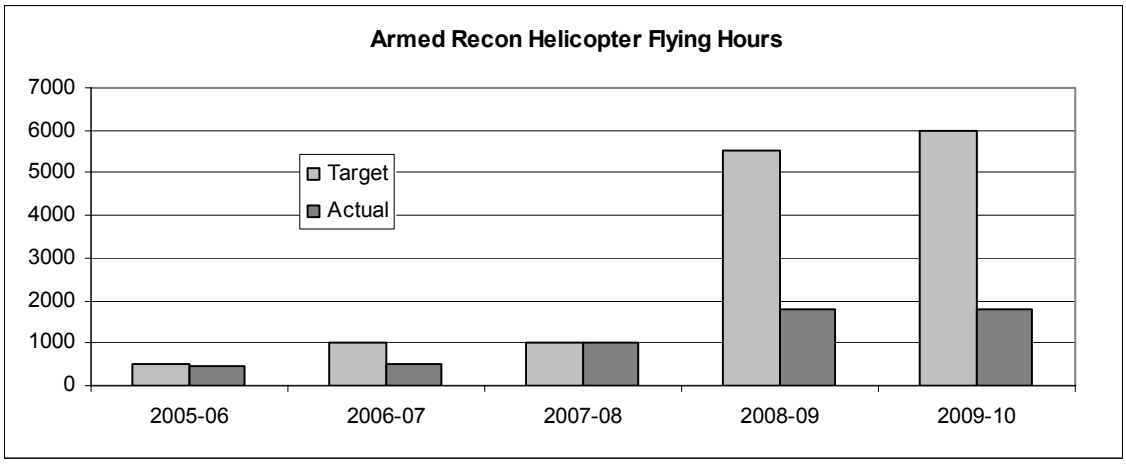
16th Brigade

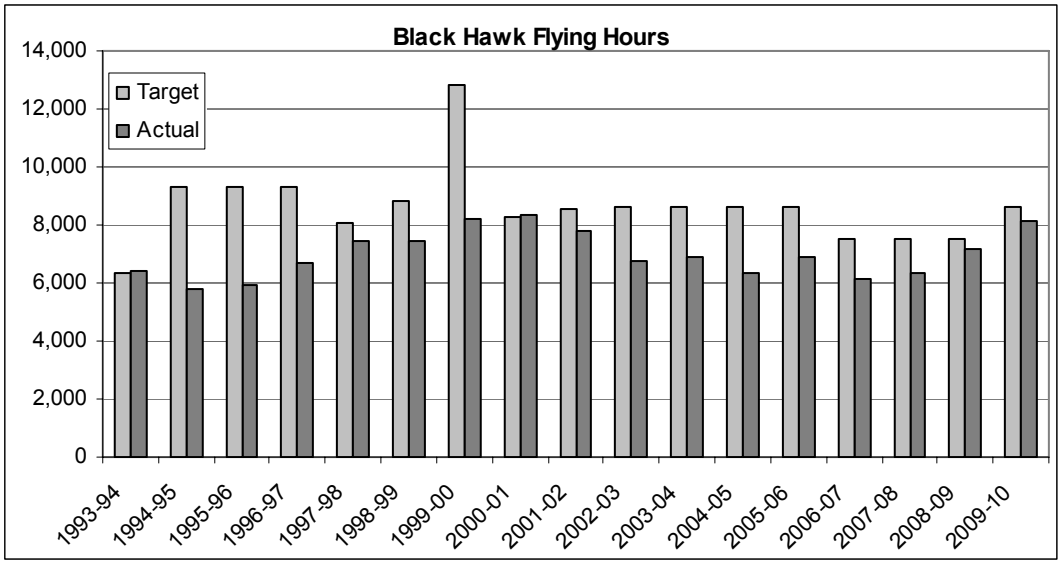
Army aviation is based around 16th Aviation Brigade that is headquartered in Brisbane. The Brigade commands the 1st, 5th and 6th Aviation Regiments, which have components in Oakey and Townsville in Queensland; Darwin in the Northern Territory; and Sydney in New South Wales. The force structure includes:

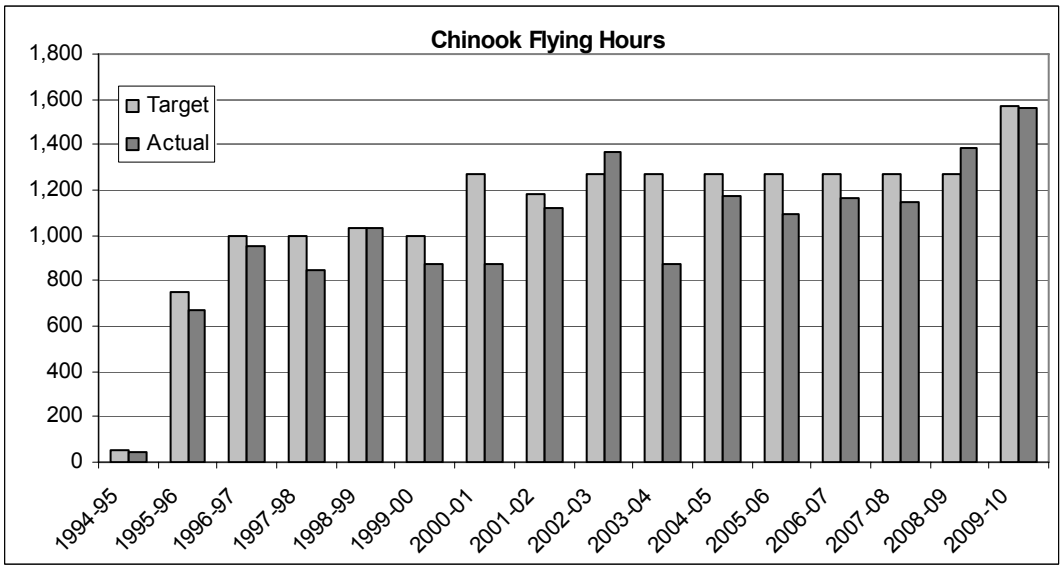
- thirty-four 1970s-designed *Black Hawk* troop-lift helicopters;
- forty-one 1970s-designed *Kiowa* light observation & training helicopters;
- six 1960s-designed *Chinook* medium lift helicopters. All these helicopters are of US design;
- twenty-two of an eventual fleet of twenty-four European-designed *Tiger* Armed Reconnaissance Helicopters (ARH) are now flying; and
- fifteen of an eventual forty MRH-90 troop-lift helicopters.

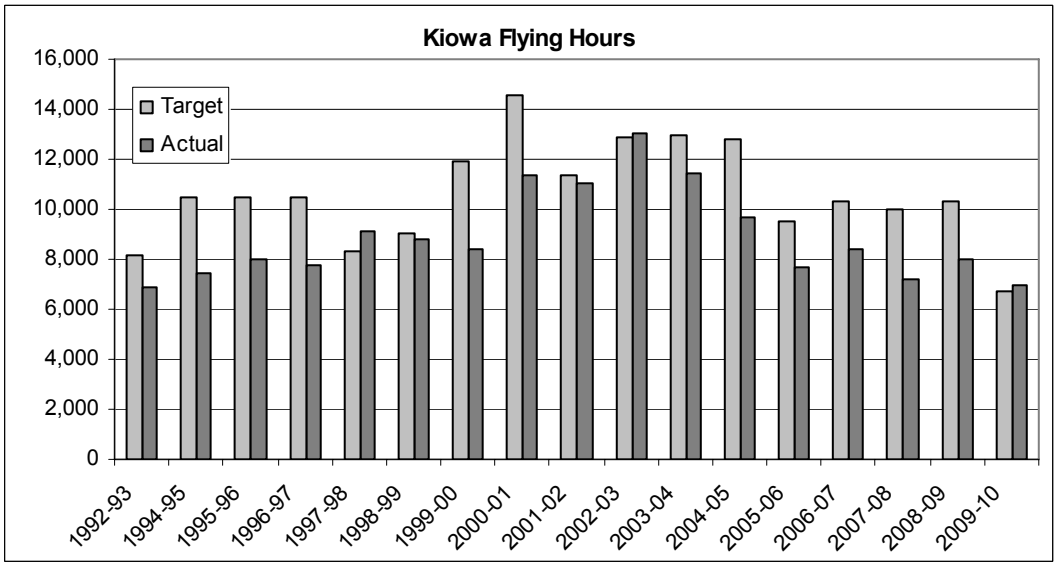
The now-retired *Iroquois* fleet and the *Black Hawk* aircraft are being replaced by forty MRH-90 troop-lift helicopters (from 2011).






Black Hawk Flying Hours
Target
Actual
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1993-94
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10


Chinook Flying Hours
Target
Actual
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10


Kiowa Flying Hours
Target
Actual
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1992-93
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10

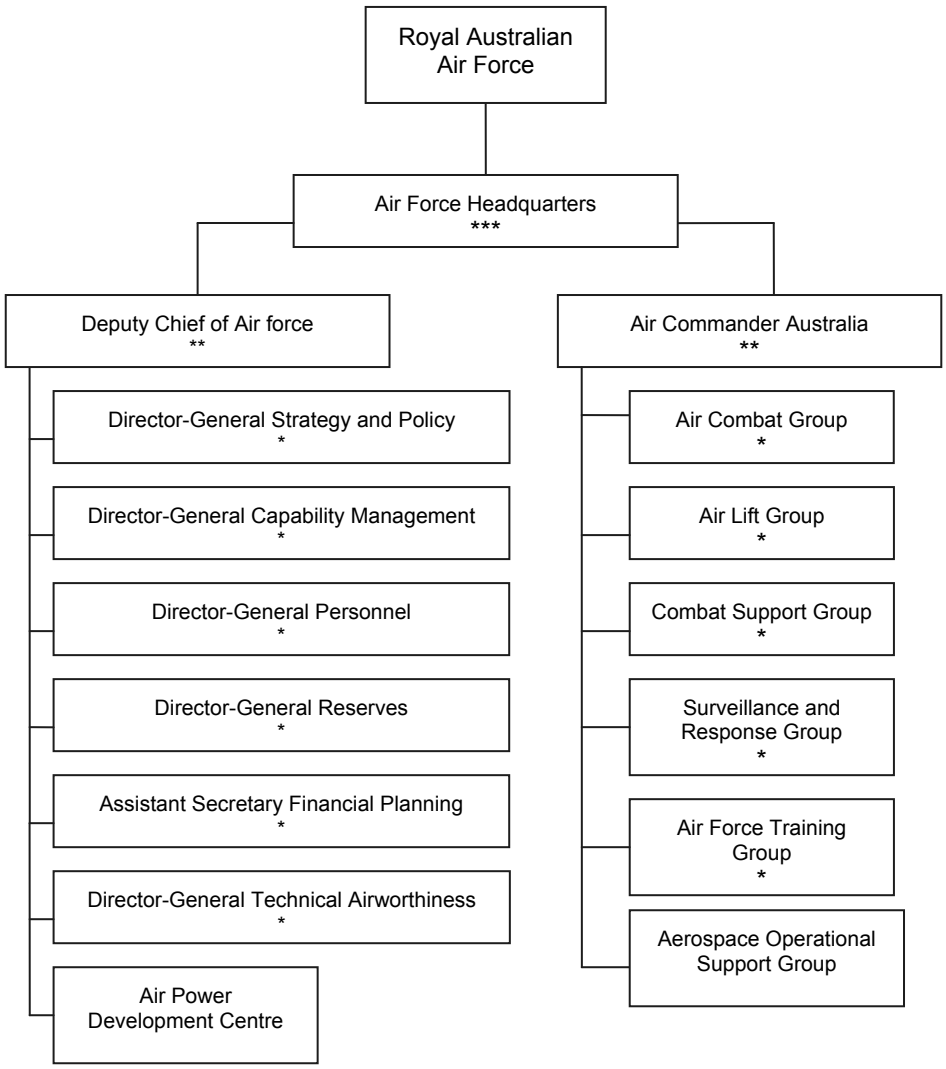
Program 1.4 – Air Force Capabilities

Department outputs 2011-12: $4,007 million

Of the three military services, the Air Force has the leanest and most streamlined organisational structure. The organisation is split into two parts. Corporate planning and administration occurs under the direction of the Deputy Chief of Air Force while Air Commander Australia takes care of six training, support and flying groups.

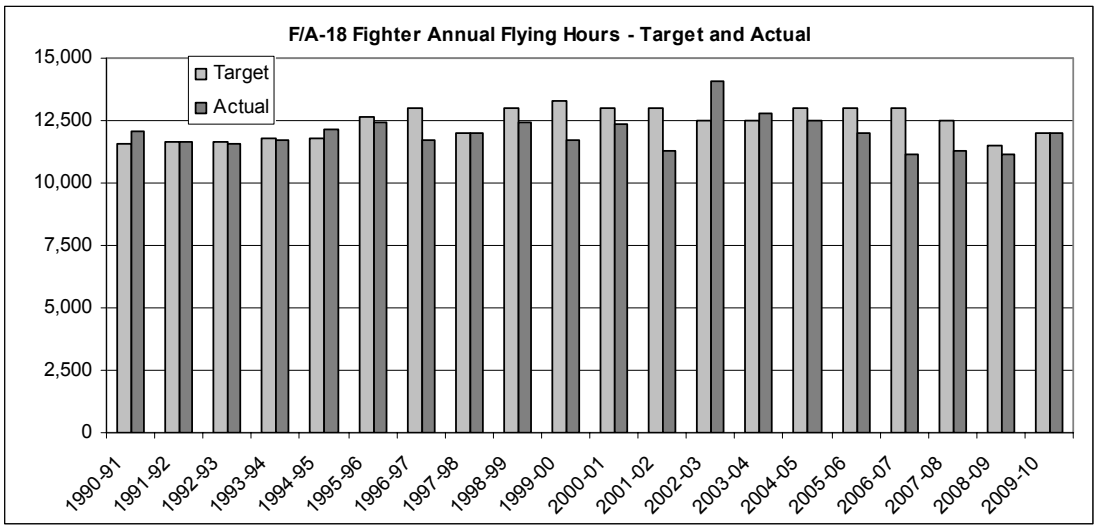
At the present moment, Air Force is introducing or preparing to introduce several new fleets of aircraft into service. These include the six new *Wedgetail* Airborne Early Warning and Control Aircraft (AEW&C), five replacement Air-to-Air Refuelling (AAR) aircraft and twenty-four *F/A-18F Super Hornet*. By the end of the decade, the Air Force hopes to be operating new F-35 *Lightning II* Joint Strike Fighter aircraft from the United States.

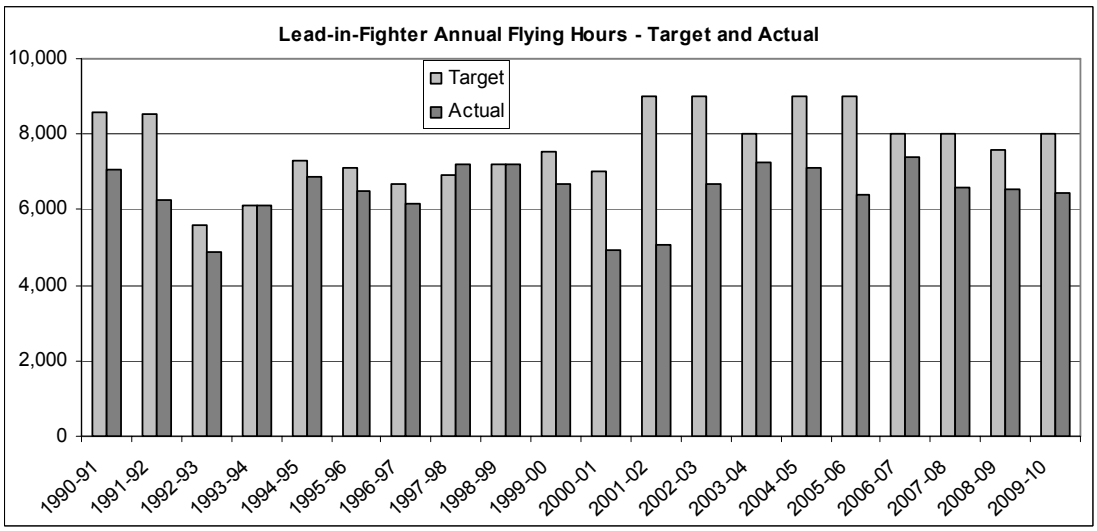
The current Air Force inventory is detailed overleaf, including performance information where available.



Air Combat Group

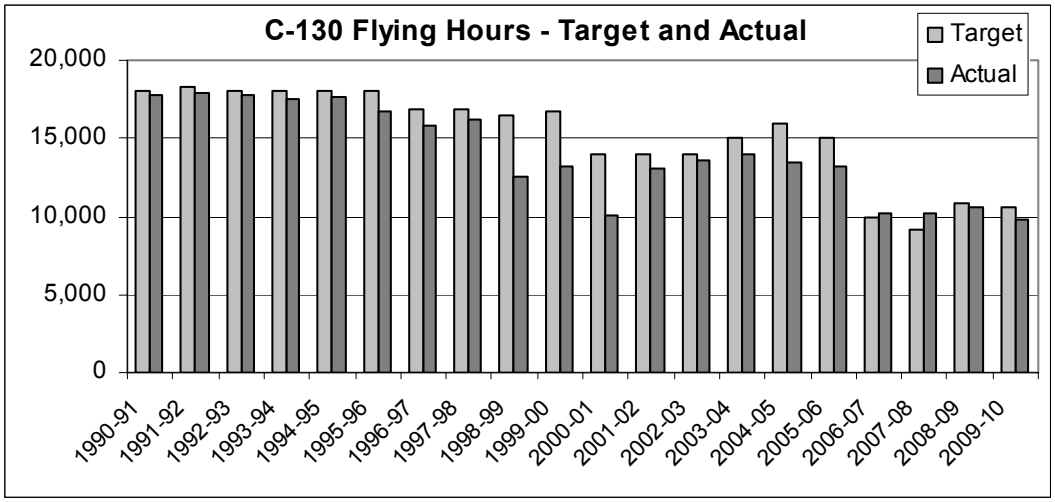
Air Combat Group comprises seventy-one F/A-18 A/B *Hornet* fighter aircraft and fifteen F/A-18F Super Hornets with the remaining nine Super Hornets expected to be delivered by October 2011. In addition, thirty-three *Hawk* Lead-in-Fighters (LIF) provide a training capability while four PC-9(F) forward air control aircraft are used to designate ground targets and train Joint Terminal Attack Controllers. Air Combat Group also supports and operates the leased Heron Remotely Piloted Aircraft which is deployed to Afghanistan.

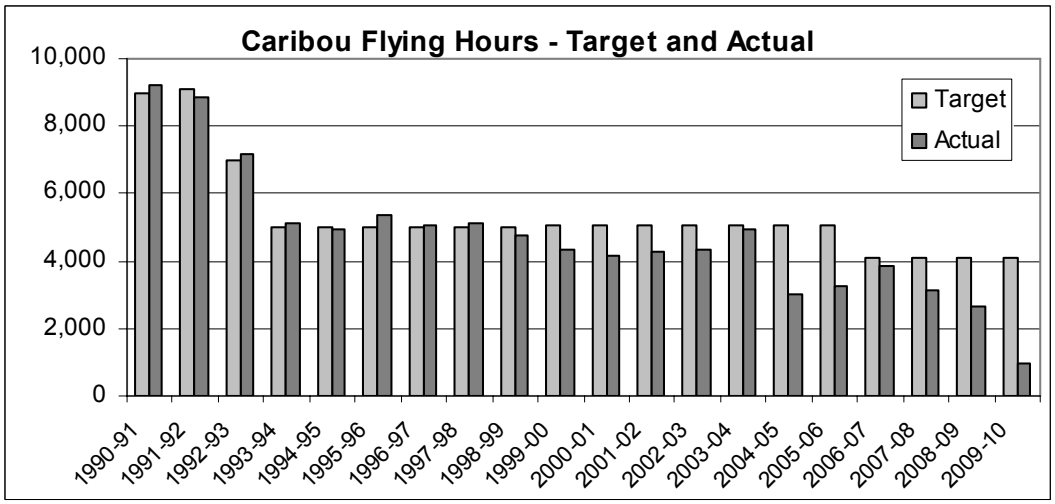




Airlift Group

The Air Force has twelve C-130J *Hercules* and twelve (four in preservation) C-130H *Hercules* transport aircraft which are capable of a wide range of strategic and tactical airborne roles. The recent acquisition of four Boeing C-17 *Globemaster IIIs* (with a fifth to be delivered in Aug 11) provides the capability to transport large and heavy loads over long ranges whilst retaining tactical capabilities. Two Boeing 737 BBJ and three CL604 *Challenger* aircraft provide VIP transport for the government. Eight B-300 *King Air* aircraft, recently replacing the venerable DHC-4 Caribou, provide a light air transport role as an interim capability prior to the introduction of the Battlefield Airlift (BFA) aircraft. Additionally, the pending introduction of the KC-30A will be a force multiplier in its duel tanker and transport role.


C-130 Flying Hours - Target and Actual
Target
Actual
20,000
15,000
10,000
5,000
0
1990-91
1991-92
1992-93
1993-94
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10


Caribou Flying Hours - Target and Actual
Target
Actual
10,000
8,000
6,000
4,000
2,000
0
1990-91
1991-92
1992-93
1993-94
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
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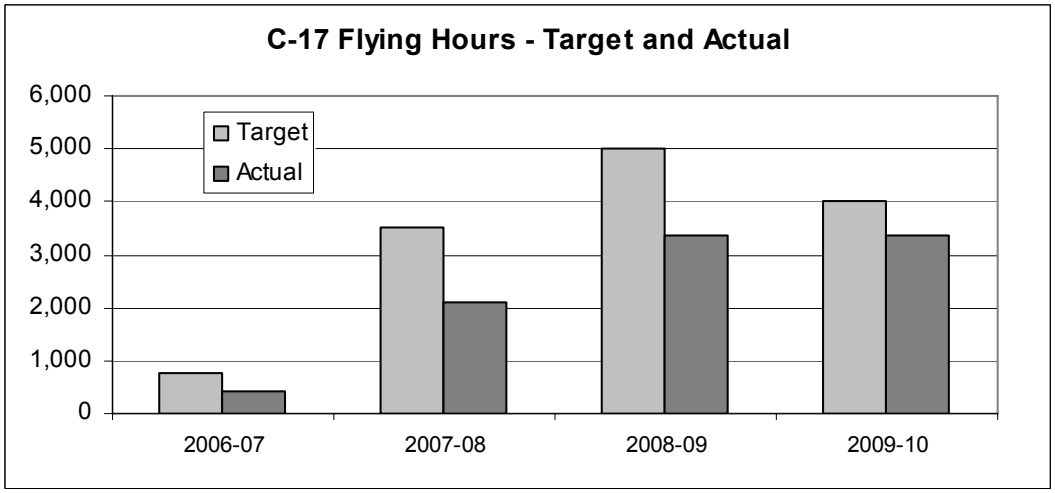
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10


C-17 Flying Hours - Target and Actual
Target
Actual
6,000
5,000
4,000
3,000
2,000
1,000
0
2006-07
2007-08
2008-09
2009-10

Surveillance and Response Group

The Surveillance and Response Group comprises a diverse range of capabilities including:

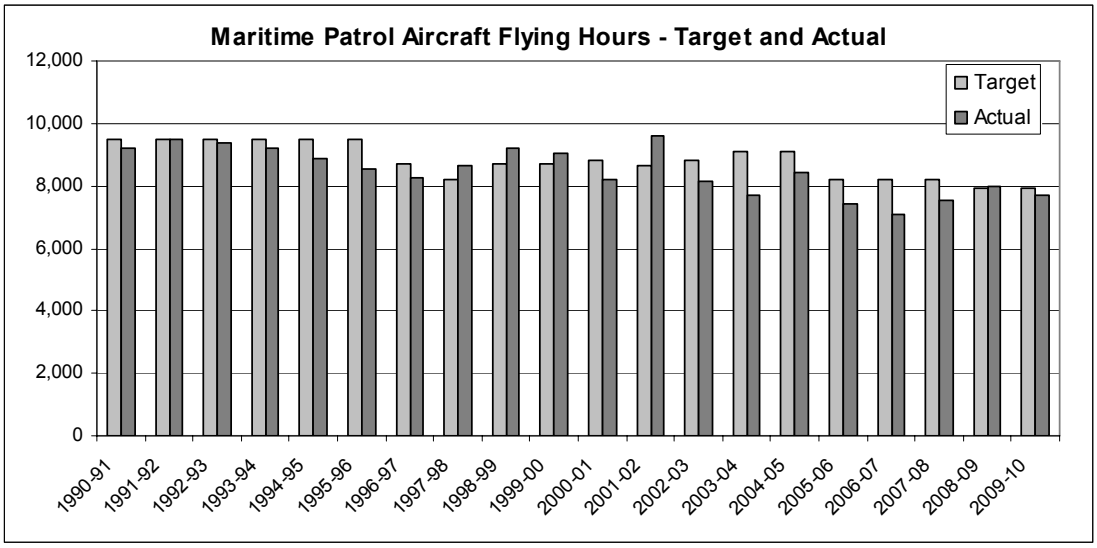
Nineteen 1970s vintage AP-3C *Orion* maritime patrol aircraft which undertake maritime patrol, maritime surveillance, reconnaissance, offensive air support, surface & sub-surface strike, and search and survivor supply. All nineteen aircraft have been upgraded to AP-3C standard through an Australian-unique upgrade program.

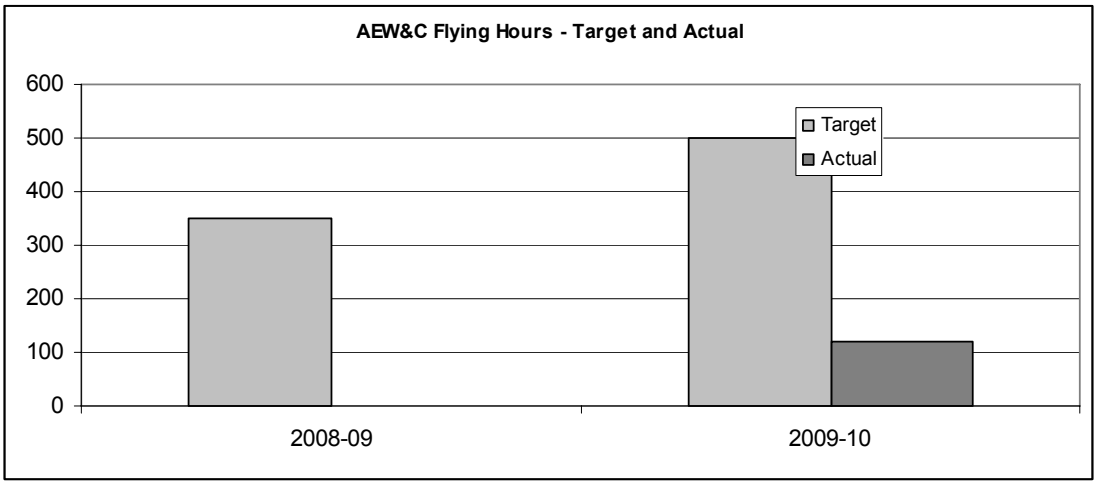
Ten Air Traffic Radars, including nine fixed radar and one mobile for the control of ADF air traffic.

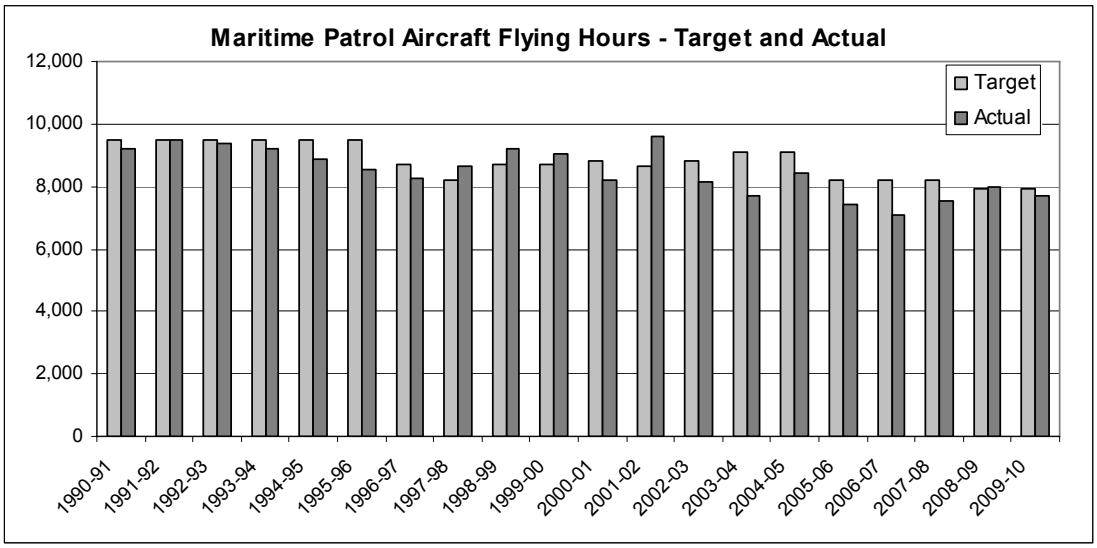
Four Tactical Air Defence Radars: ground based radar to detect hostile and own aircraft.

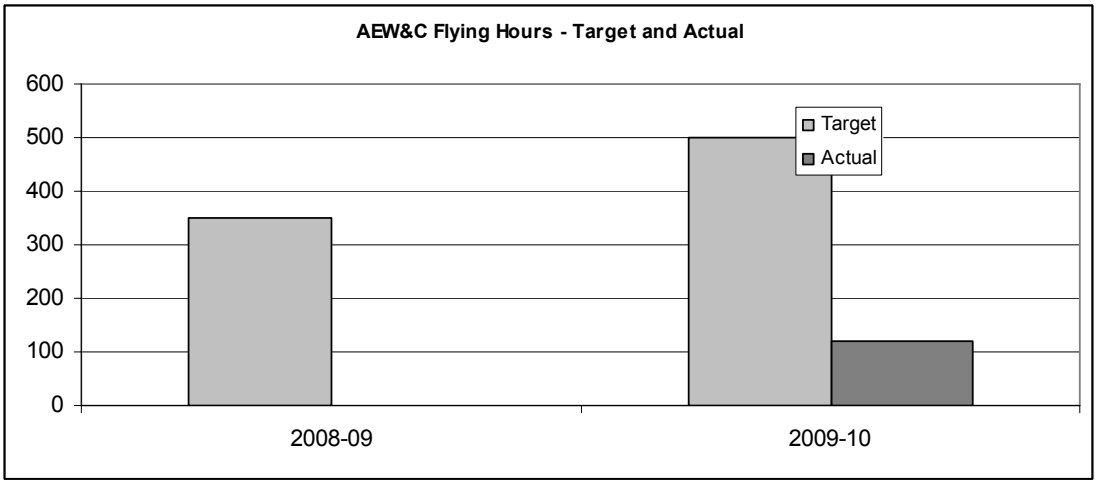
The JORN Over-the-Horizon-Radar network, including radar sites in Laverton WA and Longreach Qld, and seventeen coastal beacons in the north of Australia and Christmas Island. The network is run from the Jindalee Operational Radar Network Correlation Centre in Edinburgh, SA, and can detect both sea and air-borne moving objects. The Jindalee facility Alice Springs serves a research and development function. JORN is operated by No. 1 Radar Surveillance Unit.

Six *Wedgetail* AEW&C aircraft based on Boeing *737-700* platform whose entry into service has been delayed by more than four years due to technical problems









Aerospace Operational Support Group

The Aerospace Operational Support Group provides a broad range of operational and technical support services to Defence in general and Air Force in particular. Key components of the Group include:

Information Warfare Wing which provides electronic warfare, aeronautical information, intelligence and information operation products and services for Air Force air operations and the other Services. .

Development and Test Wing which provides flight test, system engineering and aviation medicine products and services for extant and emerging ADF aviation capability.

Woomera Test Range which provides an instrumented weapons test and evaluation range for Defence.

Combat Support Group

The Combat Support Group is the largest of the Air Forces force element groups. The role of Combat Support Group (CSG) is to provide combat support services to all Air Force operational formations and when applicable ADF and Coalition Aviation formations. CSG must be able to deploy a Main Operating Base and two Forward Operating Bases.

The capability for combat support of air operations provides for deployable tactical air base support. It encompasses Bare Base activation including the provision of engineering infrastructure (facilities, water, power and sewerage systems), aircraft arrestor barriers and airfield services, navigation aid and tactical communications, air movement, airfield defence, health support including AME, combat logistics and personnel support capabilities.

CSG provides deployed combat support, excluding aircraft technical maintenance, to ADF contingency air operations at main operating bases, forward operating bases and point of entry airfields in Areas of Operations (AO) either in Australia or overseas. It also provides command and cadre staff for RAAF fixed bases in northern Australia and management of the prepared Bare Bases at RAAF Learmonth (LMO), Curtin (CIN), and Scherger (SGR). The provision of secure airfields and combat support arrangements for the deployment of air assets will continue to be critical to the support of ADF operations.

CSG comprises of a HQ, a Combat Support Coordination Centre, 395 and 396 Expeditionary Combat Support Wings and a Health Services Wing.

Air Force Training Group

The Air Force Training Group is made up of a headquarters and Air Training Wing, Ground Training Wing, RAAF College and Reserve Training Wing. The headquarters of the Air Training Group is located at RAAF Base Williams – Laverton, Victoria.

Air Training Wing conducts basic and instructor air training for ADF personnel including pilots, air combat officers and air traffic controllers. Basic pilot training employs PC-9/A aircraft while aircraft and navigator training occurs on B350 aircraft. Air Training Wing also includes the RAAF Roulettes, who provide fly pasts and displays, the RAAF Museum and the RAAF Balloon. The Air Training Wing is also responsible for air crew combat survival training.

The RAAF College provides induction and professional military training for the Air Force. The RAAF College also maintains the RAAF Band.

Ground Training Wing provides initial and ongoing training for non-aircrew personnel, including security, fire and ground defence, administration and logistics, technical trades, and explosive ordnance.

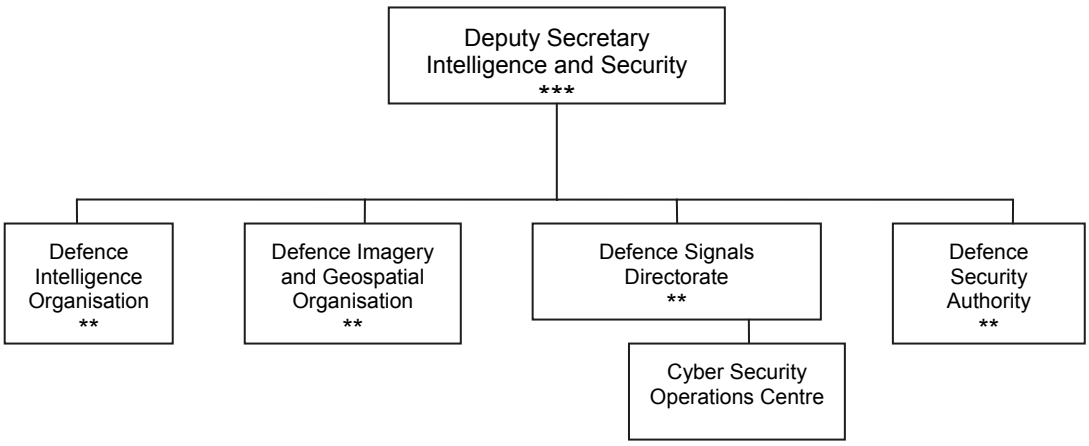
Reserve Training Wing provides ground training to Air Force Reserve members at a number of locations around Australia.

Program 1.5 – Intelligence Capabilities

Department outputs 2011-12: $531 million

Overview

The Intelligence and Security Group is responsible for a number of Defence and national intelligence capabilities and the Defence Security Authority. Defence intelligence collection and analysis supports ADF operations, Defence policy making (including force development) and supports wider government decision making.



Defence Intelligence Organisation (DIO) at Russell Offices in Canberra is responsible for assessing military intelligence that focuses on global security activity, terrorism, defence economics, military capability, and science and technology that has military applications. DIO produces reports, briefs and assessments on an ongoing basis as well as in response to emerging areas of concern, to support Defence and Government decision-making and assist with the planning and conduct of ADF operations.

Defence Imagery and Geospatial Organisation (DIGO) includes an HQ at Russell Offices in Canberra and the Geospatial Information Branch in Bendigo. DIGO obtains and produces geospatial and imagery intelligence, including maps and charts, about the capabilities, intentions or activities of people or organisations outside Australia. It supports ADF operations and training, as well as Commonwealth and State authorities in carrying out national security functions. DIGO also sets technical standards for imagery and geospatial products, and provides Commonwealth and State authorities, and other bodies approved by the Minister, with non-intelligence products, technical assistance and support to carry out their emergency response functions.

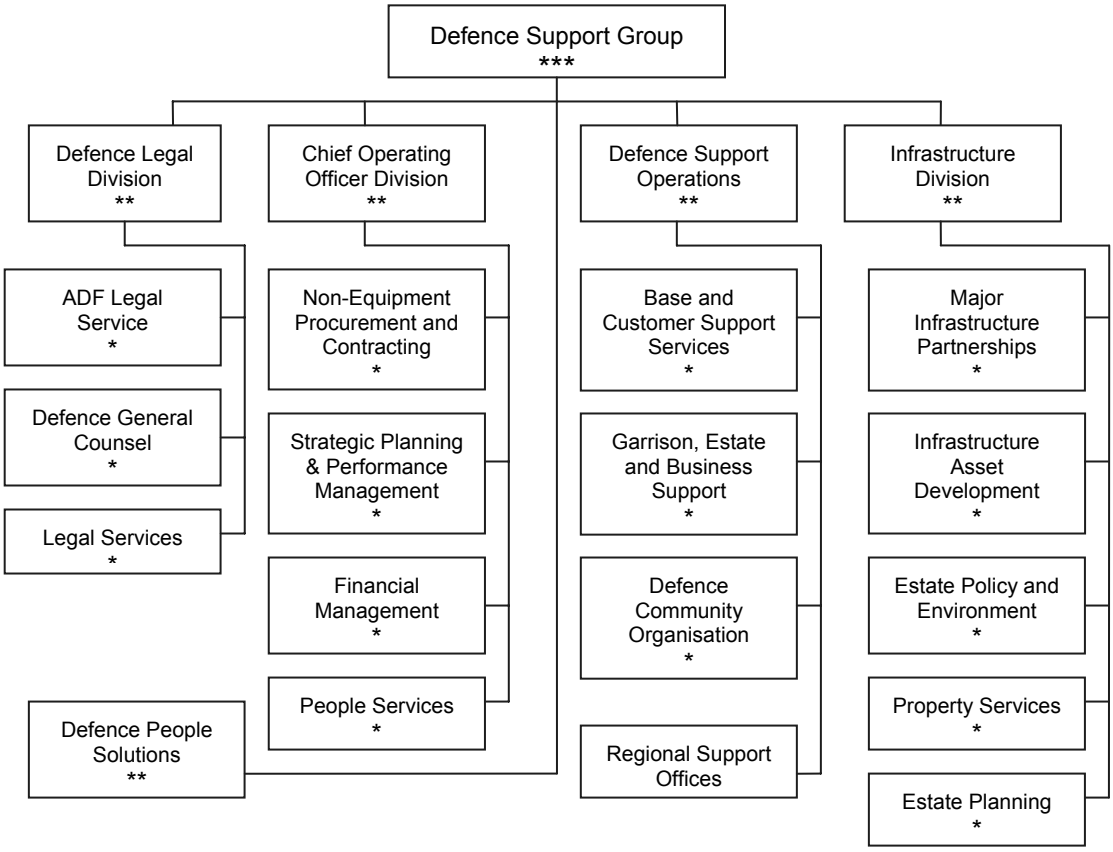
Defence Signals Directorate (DSD) collects and analyses foreign signals intelligence (and is prohibited by law from collecting domestic intelligence) for the Australian government and the ADF in support of military and strategic decision-making. Support to military operations continues to be the primary goal of DSD's foreign signals intelligence activities. DSD also provides information and communications security advice and services, predominantly to Commonwealth and State authorities, as well as working closely with industry to develop and deploy secure cryptographic products. DSD has its HQ in Russell Offices in Canberra and maintains collection facilities at multiple locations elsewhere. The recently created Cyber Security Operations Centre is located within DSD.

The Defence Security Authority (DSA) is responsible for the security of Defence assets and information, including the development and implementation of security policies and ensuring compliance across Defence. The recently established Australian Government Security Vetting Agency (AGSVA) is also located within DSA and is responsible for vetting personnel across government, except for a small number of exempt agencies, for access to classified information. DSA also manages the Defence Industry Security Program.

Program 1.6 – Defence Support

Department outputs 2011-12: $3,528 million

The Defence Support Group provides a range of administrative, garrison, legal, personnel and estate services to Defence. The Group is divided into five divisions. Infrastructure Division plans, builds and upgrades the Defence estate. Defence Support Operations Division provides on-the-ground services and support to Defence personnel throughout Australia including facilities maintenance and garrison support, including grounds maintenance, hospitality, training area management, base security, transport, air support and fire-fighting and rescue services. The Chief Operating Officer Division is responsible for managing a range of whole-of-Defence shared services including payroll, simple procurement, accounts processing and debt management along with business management, strategic planning and policy support services to the Group. Defence Legal Division provides legal services and advice to Defence. Defence People Solutions is responsible for a range of personnel-related services including management of conduct, performance and probation issues, managing complex people issues and delivery of the Defence Work Experience program.

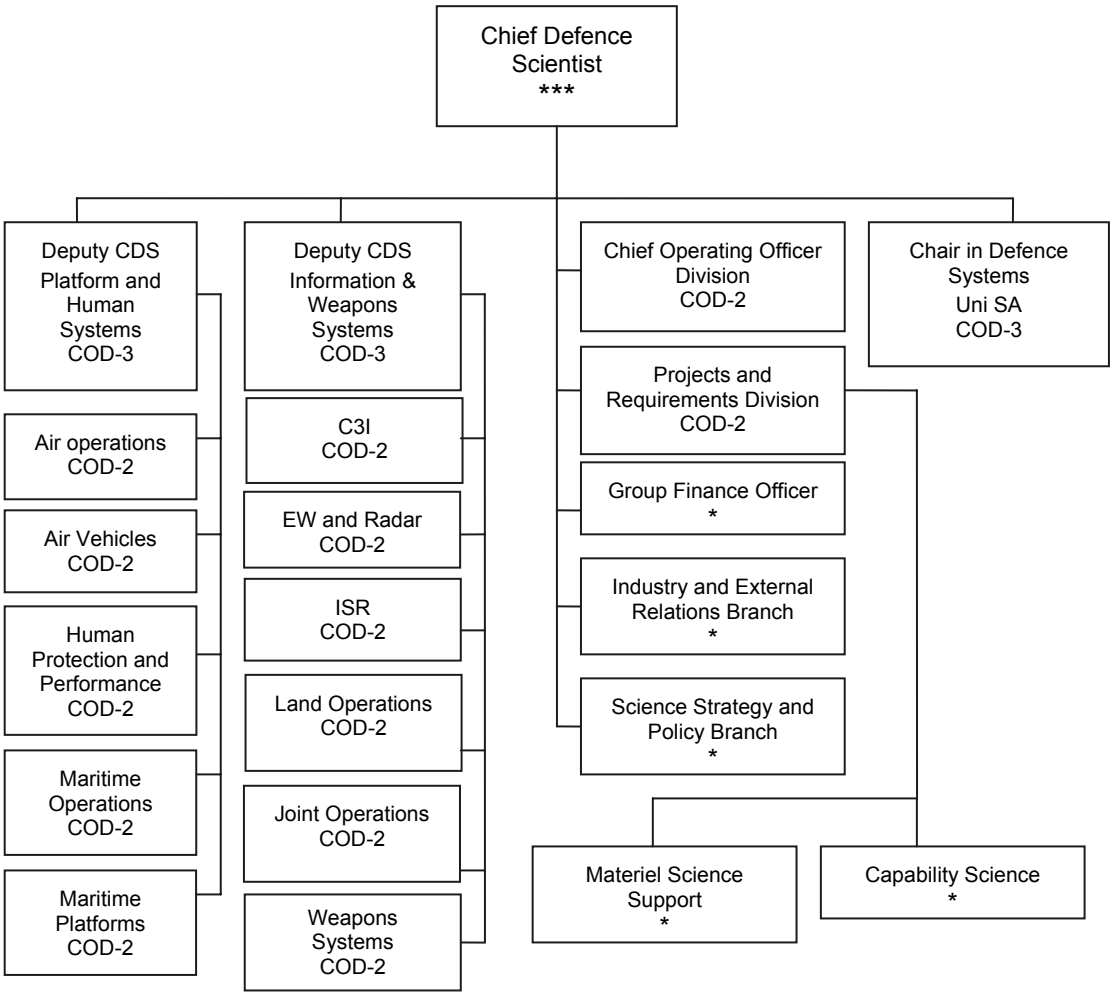


Program 1.7 – Defence Science & Technology

Department outputs 2011-12: $434 million

The Defence Science and Technology Organisation (DSTO) provides scientific and technical advice and support to the ADF including support to operations, the force-in-being, the DCP and future proofing defence capabilities. The organisation is led by the Chief Defence Scientist, an SES Band 3 who answers to the Secretary. There is a support part of DSTO headed in Canberra. The bulk of the defence science and technology activity is carried out in Platform and Human Systems in Melbourne and Information and Weapons Systems in Adelaide each under the leadership of two Deputy Chief Defence Scientists (DCDS) who are Chiefs of Division Grade 3 (COD-3). Under each of the DCDSs are a number of divisions each led by a Chief of Division (Chief of Division Grade 2). There is one Chief of Division (COD-3) seconded to the position of Chair in Defence Systems at the University of South Australia. Below the level of Chief of Division branch level entities in DSTO are led by Research Leaders (Executive Level 2 officers).

Scientific Advisors are out-posted from DSTO to the Army, Navy, Air Force, Capability Development Group, Defence Materiel Organisation, Vice Chief of the Defence Force and Intelligence and Chief Information Officer Groups.



Program 1.8 – Chief Information Officer

Department outputs 2011-12: $760 million

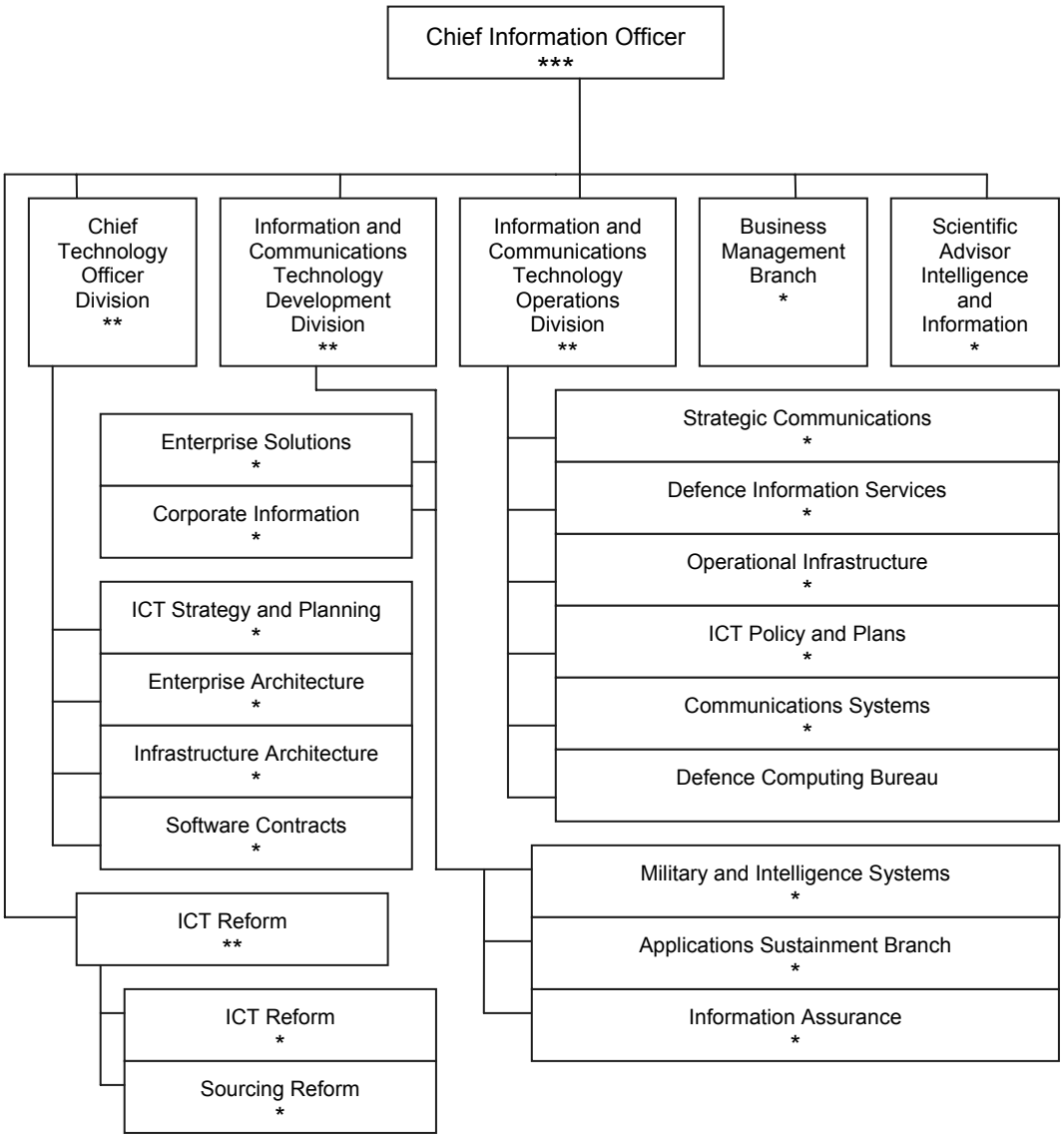
The Chief Information Officer Group is responsible for providing Information and Communications Technology (ICT) to Defence. The bulk of the Group resides in four divisions.

Chief Technology Officer Division develops and documents Defence's ICT architecture, identifies relevant systems and defines ICT standards for Defence.

Information and Communications Technology Development Division designs and develops Software Systems for the Defence information environment.

Information and Communications Technology Operations Division delivers and supports the Defence Information and Communication infrastructure.

Information and Communications Technology Reform Division delivers ICT reform and associated savings across the Defence Portfolio.



Program 1.9 – Vice Chief of the Defence Force

Department outputs 2011-12: $856 million

The Vice Chief of the Defence Force (VCDF) is the military deputy to the CDF. In addition, the VCDF is responsible for the following:

Military Strategic Commitments provides the strategic level management and situational awareness of potential and current Australian Defence Force Commitments. This includes providing joint military strategic input for engagement with government, other agencies, allies and coalition partners.

Joint Logistics Command provides logistics support to raise, train and sustain the Australian Defence Force including management of warehouses, maintenance, and distribution facilities. This does not include the extensive range of materiel maintenance provided by the DMO.

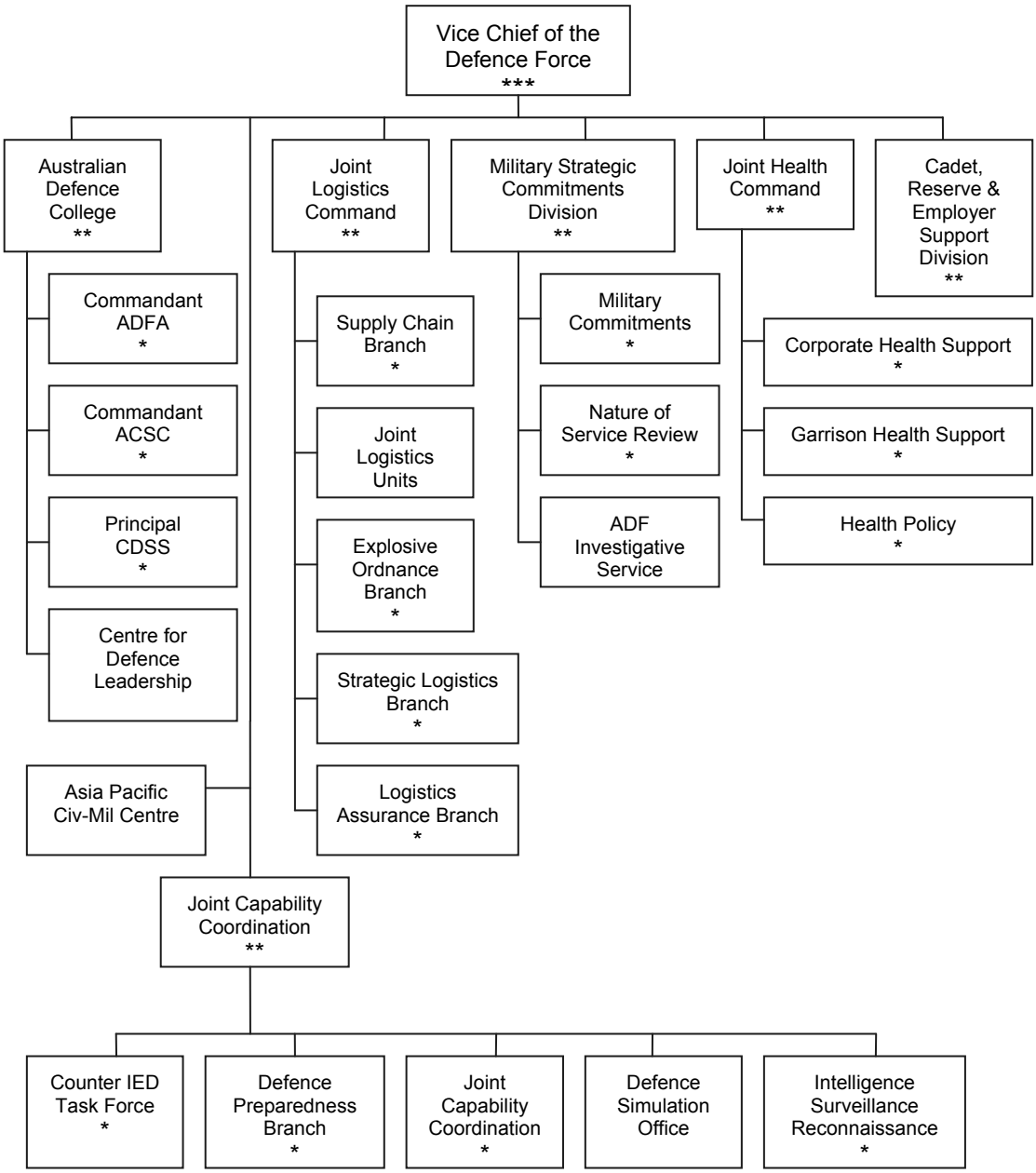
Joint Health Command is responsible for the delivery of all garrison health care to the ADF and exercises technical control through the Surgeon General Australian Defence Force.

Australian Defence College was established to meet the strategic needs of the Australian Defence Force for joint professional military education and individual joint warfare training this is achieved through the Centre for Defence and Strategic Studies, the Australian Command and Staff College and the Australian Defence Force Academy.

Joint Capability Coordination Division manages ADF preparedness and joint capability coordination. JCC was established to improve Defence's capacity to deliver joint force capability.

Cadet, Reserve and Employer Support Division works to enhance the capacity of Reserves to support ADF capability and provides a governance and accountability framework for the ADF Cadet Scheme.

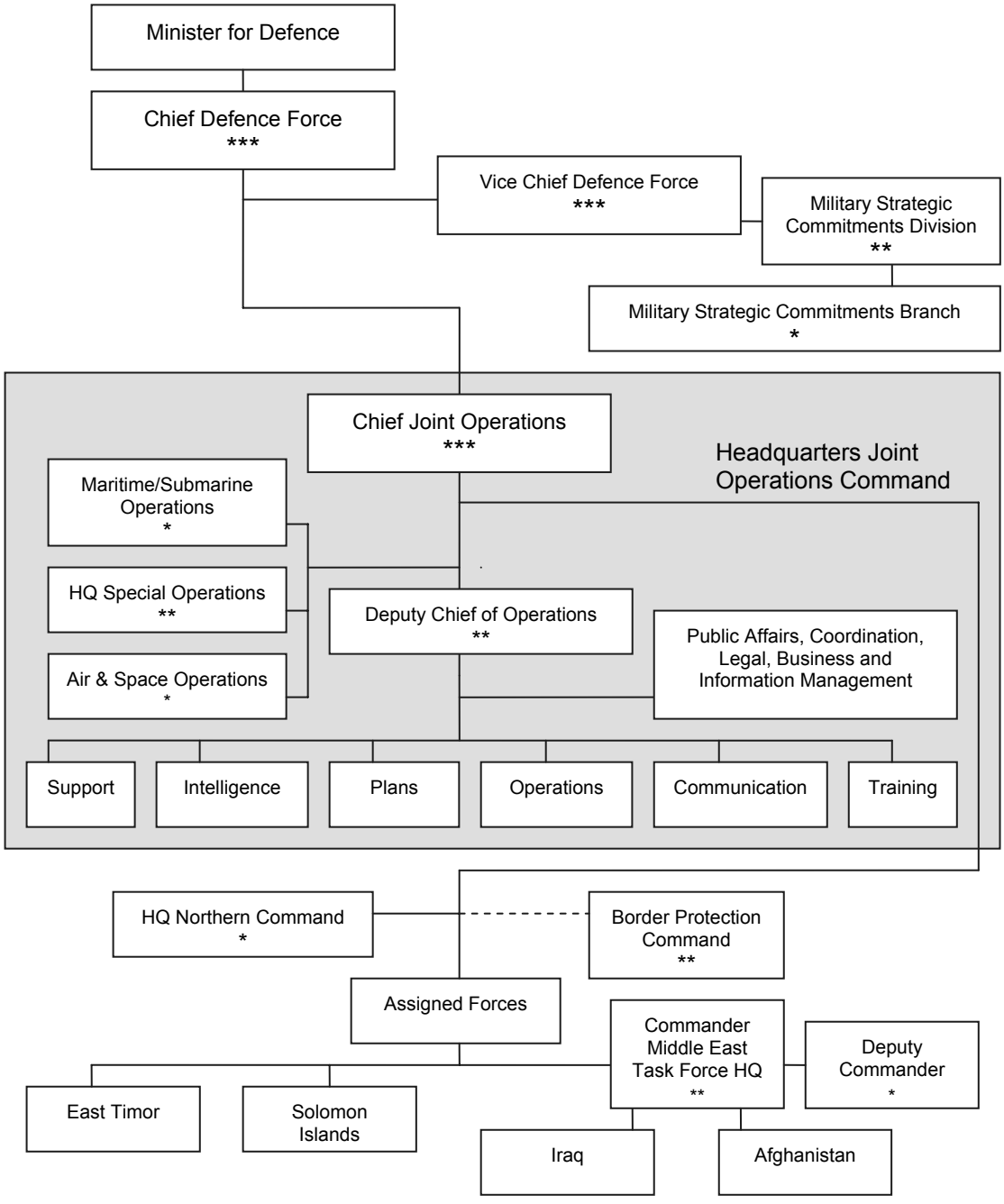
The Asia Pacific Civil Military Centre of Excellence is a whole-of-government initiative to improve Australia's effectiveness in civil-military collaboration for conflict and disaster management overseas.


Vice Chief of the Defence Force
***
Australian Defence College
**
Joint Logistics Command
**
Military Strategic Commitments Division
**
Joint Health Command
**
Cadet, Reserve & Employer Support Division
**
Commandant ADFA
*
Commandant ACSC
*
Principal CDSS
*
Centre for Defence Leadership
Asia Pacific Civ-Mil Centre
Supply Chain Branch
*
Joint Logistics Units
Explosive Ordnance Branch
*
Strategic Logistics Branch
*
Logistics Assurance Branch
*
Military Commitments
*
Nature of Service Review
*
ADF Investigative Service
Corporate Health Support
*
Garrison Health Support
*
Health Policy
*
Joint Capability Coordination
**
Counter IED Task Force
*
Defence Preparedness Branch
*
Joint Capability Coordination
*
Defence Simulation Office
Intelligence Surveillance Reconnaissance
*

Program 1.10 – Joint Operations Command

Department outputs 2011-12: $46 million

Joint Operations Command (JOC) is responsible for the command of all ADF operations and joint exercises on behalf of the Chief of the Defence Force. Located in a purpose built command facility in Bungendore NSW, JOC is assigned forces for operations from the three Services. The total ADF command arrangement is outlined below. At present, there are approximately 3,300 ADF personnel deployed on operations and somewhere around 750 personnel involved in planning, advising and commanding operations, of which around 750 (including contractors) reside in JOC and SOCOMD.



Program 1.11 – Capability Development

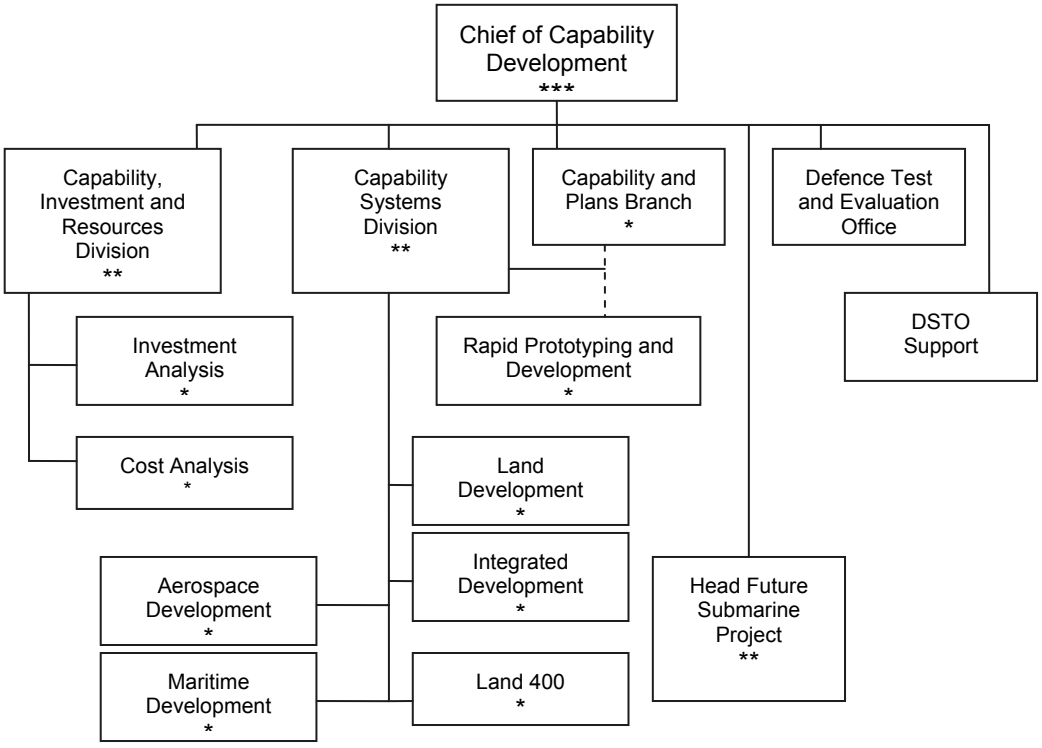
Department outputs 2011-12: $748 million

The Capability Development Group develops and manages the Defence Capability Plan (DCP) and prepares Defence capability investment approval proposals for Government consideration. Two divisions, Capability Systems and Capability Investment and Resources, constitute the core of the Group

Capability Systems Division is largely staffed by military personnel and manages the development of future capability options for Government consideration. It is divided into four branches; three environmentally-based (land, sea and air), and one dealing with integrated capabilities that cross environmental lines. Another element is the Rapid Prototyping and Development Organisation, which works with industry and academe to develop capability solutions for the ADF.

Capability Investment and Resources Division is largely staffed by civilian personnel and provides independently analyses and reviews capability issues, including the overall balance of investment in current and future capability, major investment proposals and priorities. It is divided into two core branches; Investment Analysis and Cost Analysis.

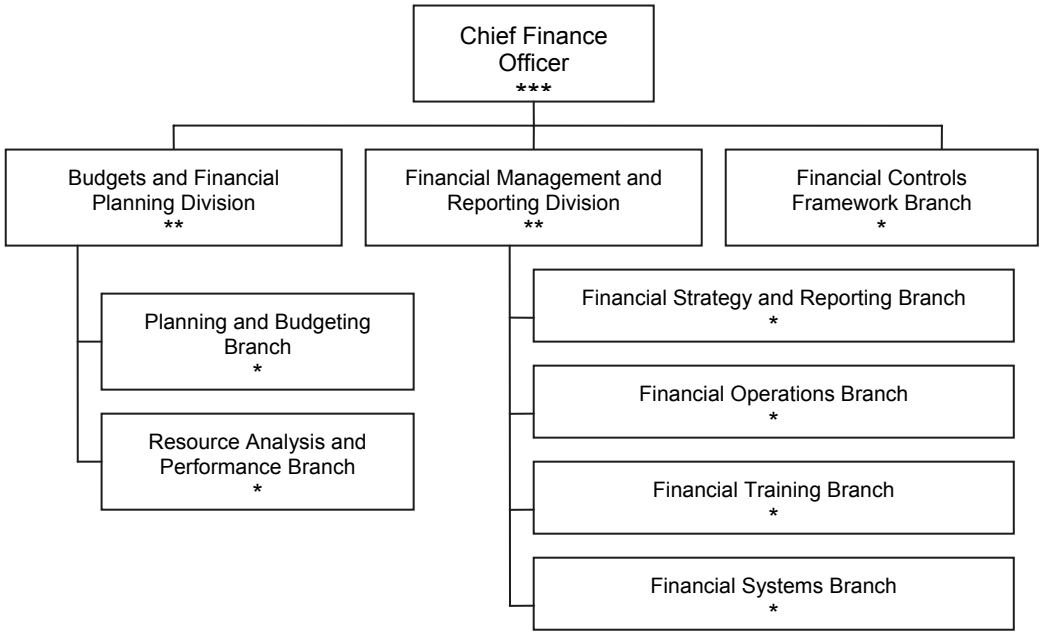
Three other elements within the Group are; the Capability and Plans Branch which ensures that Defence capabilities match the Government's strategic objective, the Australian Test and Evaluation Office that provides T&E advice and guidance throughout the capability life cycle, and the embedded DSTO support cell. In 2010, the Head Future Submarine Program was also established as a separate entity in the Group.



Program 1.12 – Chief Finance Officer

Department outputs 2011-12: $644 million

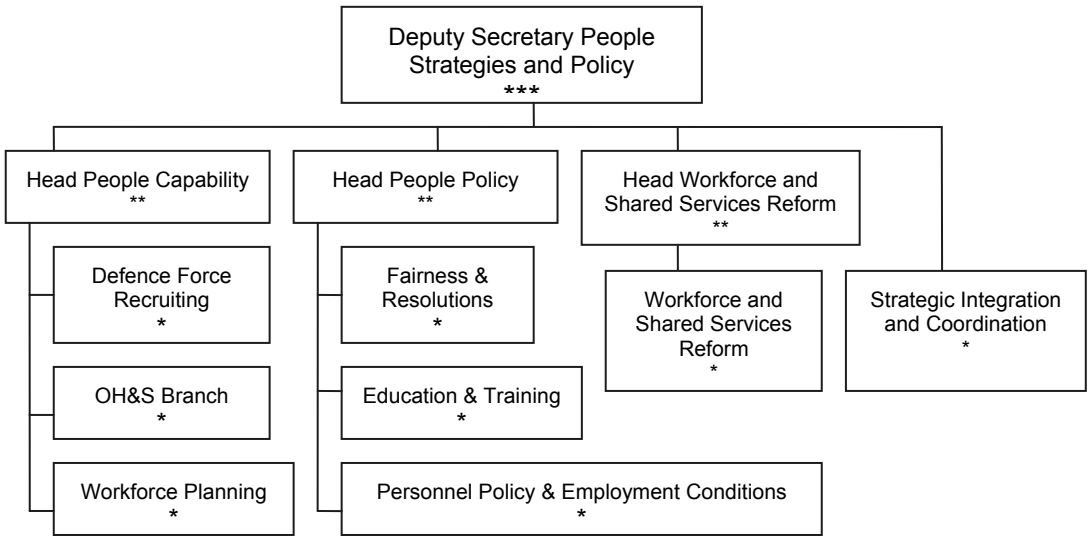
The Chief Finance Officer Group is responsible for Defence's financial planning, budgeting and reporting.



Program 1.13– People Strategies and Policy

Department outputs 2011-12: $326 million

The People Strategies and Policy Group formulates personnel policy for the ADF and Defence civilian workforces. Apart from Defence Force Recruiting and Fairness and Resolution Branches, the actual delivery of personnel services is the responsibility of other entities, especially the Defence Support Group.



Program 2.1 – Ops in the immediate neighbourhood

Department outputs 2011-12: $204 million

- Op *Gateway*: Indian Ocean and South China Sea maritime patrols (since 1981)
- Op *Anode*: Support coalition police forces in Solomon Islands (since 2003)
- Op *Astute*: Security support for the Government of East Timor and UN mission (since 2006)
- Op *Tower*: Contribute to UN Integrated Mission in East Timor (since 2006)

Program 2.2 – Ops supporting wider interests

Department outputs 2011-12: $1,375 million

- Op *Paladin*: Contribute to the UN Truce Supervisory Mission in the Middle East (since 1956)
- Op *Mazurka*: Contribute to Multinational Force and Observers in the Sinai (since 1982)
- Op *Slipper*: Contribute to ISAF in Afghanistan (since 2001)
- Op *Azure*: Contribute to UN Mission in Sudan (since 2005)
- Op *Palate II*: Liaison Officer to UN Mission in Afghanistan (since 2005)
- Op *Hedgerow*: Contribute to UN-AU Mission in Darfur (since 2008)
- Op *Riverbank*: Contribute to UN Mission in Iraq (since 2008)
- Op *Kruger*: Security support to AS diplomatic mission in Iraq (since 2009)

Program 3.1 – National support tasks

Department outputs 2011-12: $10 million

- Op *Solania*: Conduct South West Pacific maritime patrols (since 1988)
- Op *Resolute*: Contribute to whole-of-government maritime enforcement effort (since 2006)

Defence's contribution to national support tasks ranges from the ongoing routine allocation of Patrol Boat and AP-3C Maritime Patrol Aircraft time, to the allocation of specific capabilities at short notice in a national support emergency. National support tasks include security, ceremonial, civil maritime surveillance, search and rescue, bush fire response and support to the Army / ATSIC community assistance program.

2.7: Explanatory Tables and Budgeted Financial Statements [PBS Section 3: pp. 108 – 144]

The budgeted financial statements for Defence appear in Section 3 of the PBS. Once again consolidated financial statements for Defence and DMO have been included.

2.8: Defence Materiel Organisation PBS [Defence Materiel Organisation PBS: pp. 145 – 208]

On 1 July 2005 DMO became a prescribed agency under the *Financial Management and Accountability Act 1997*. Since then it has had its own independent part in the Defence portfolio PBS.

Overview

DMO acquires and supports equipment for Defence on a quasi-commercial basis. It is an independent entity from a financial perspective, but administratively is something of an agency within an agency (hence the PBS within a PBS).

Organisational structure

DMO contains fifteen divisions, each headed by a band-2 SES civilian or 2-star military officer, as shown in Figure 2.8.1. Over the past four years, five deputy-secretary level General Manager positions have been created to oversee clusters of divisions.

The divisions fall into three categories:

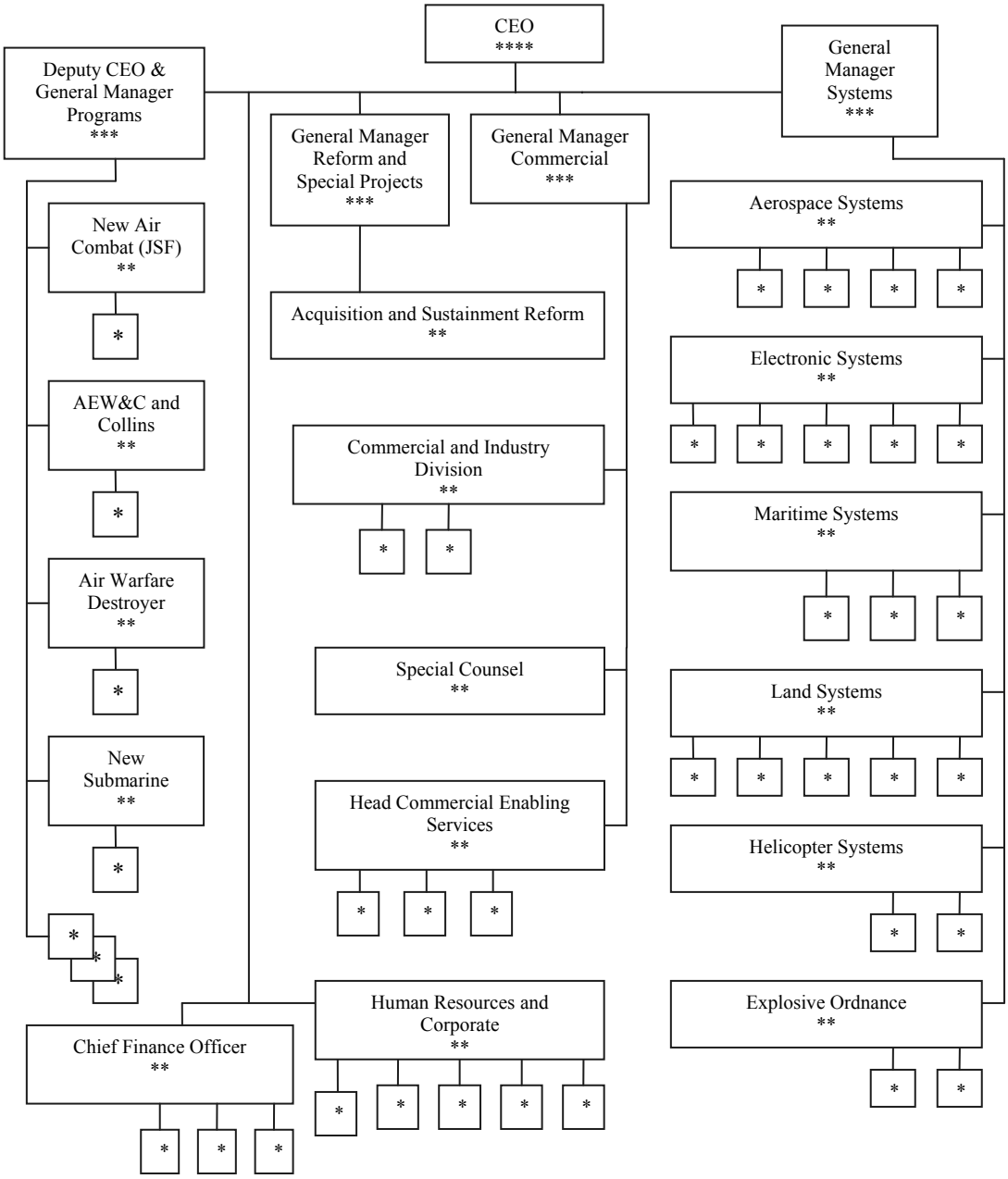
Systems divisions are set up on the traditional environmental domains of land, sea, and air, plus divisions dealing with electronics/weapons and explosives. They manage and deliver the vast bulk of the 220 major equipment acquisition projects (and more than 120 minor acquisition projects) that DMO is responsible for, and take care of the materiel support of existing capabilities—some 110 major fleet groupings—across all domains.

Programs divisions acquire high profile capabilities of strategic significance. That is, if a project is big, important (and politically sensitive) enough it gets it own dedicated division. At the moment there are three such programs: Air Warfare Destroyer, AEW&C/*Collins*, New Air Combat Capability (Joint Strike Fighter) and New Submarine project.

Three *'Commercial'* divisions provide enabling services and take care of specific areas. These are; Enabling Services, Special Counsel (legal) and Commercial and Industry Programs. There is also an Acquisition and Sustainment Reform division under the General Manager Reform and Special Projects.

Two final divisions report directly to the CEO; Chief Finance Officer DMO and Head Human Resources and Corporate Services.

Figure 2.8.1 DMO organisational structure



Source: 2011-12 PBS and online government directory

A prescribed agency

The September 2003 report from the Defence Procurement Review (known usually as the Kinnaird Review) recommended a number of changes to Defence and DMO. Key among them was to establish DMO as a separate executive agency. After consideration, the government decided to take the lesser step of making DMO a 'prescribed agency', which delivers a high degree of financial autonomy but does not provide the level of accountability or transparency intended by the Kinnaird or subsequent Mortimer reviews.

As a prescribed agency, the CEO of DMO is accountable directly to the Minister for Defence for financial matters, hence the need for separate financial statements and

budgets. On other matters, DMO still remains close to Defence from an administrative perspective; the CEO being accountable to the Chief of the Defence Force through the *Defence Act 1903* and to the Secretary through the *Public Service Act 1999*.

Resources for 2011-12 [PBS p. 151–156]

DMO will incur expenses of $11.1 billion in 2011-12. Sources of funding to cover these expenses include:

Departmental Appropriation from government to pay for policy advice and management services. In 2011-12, this will be $929 million.

Revenues from Defence in payment for acquisition and sustainment services from Defence. In 2011-12 this totals $10,099 million.

Drawdown of special account: -$10.3 million of unspent funds from prior years will be spent in 2011-12 by running down the residual in the DMO special account.

Non-appropriation receipts including things like the disposal of commercial vehicles and payments from foreign forces for materiel services provided. In 2011-12 this will amount to $56 million, and this would be called own-source revenues in Defence.

Because DMO presents its resourcing differently to Defence, we have reconstructed how the expenses are resourced as best as we can in Table 2.8.1, the residual difference is likely an accrual factor we have been unable to track down.

Table 2.8.1: DMO funding 2011-12 ($ '000s)

Funding from government		
Sustainment	5,010,000	Table 10, p. 26
Acquisition	5,089,500	Table 10, p. 26
subtotal	**10,099,500**	Table 10, p. 26
Departmental Appropriation	929,201	Table 80, p. 151
Drawdown of special account in 2010-11	-10,301	Table 93, p. 200
Non-appropriation receipts	56,012	Table 80, p. 151
Total	**11,074,412**	
Cost of DMO Outcome	**11,127,047**	Figure 5, p. 153
Difference	**- 55,635**	
Expenses not requiring funding	42,343	Table 83, p. 156
Funding gap	**-13,292**	

Source: 2011-12 PBS

DMO Special Account

Unspent funds have accumulated in the DMO Special Account in recent years. Table 2.8.2 calculates the net money deposited and withdrawn from the account since 2005-06. In effect, the residual in the Special Account represents working capital, and an element of delayed spending that is not disclosed in Defence's accounts. Note that an extra $159 million of unspent funds (in addition to the hand back of $1.5 billion) accumulated in the DMO Special Account during 2010-11.

Table 2.8.2: DMO Special Account movements ($ '000s)

	Opening balance	Closing balance	Net change
2005-06	0	167,205	167,205
2006-07	167,205	542,967	375,762
2007-08	542,967	955,743	412,776
2008-09	955,743	223,484	-732,259
2009-10	223,484	501,560	278,076
2010-11	501,560	660,931	159,371
2011-12	660,931	671,232	10,301

Source: 2011-12 PBS and various DAR

Purchaser-provider arrangements

Central to the resourcing framework for DMO are purchaser-provider arrangements with Defence for acquisition and sustainment services. In 2011-12, DMO will receive $5,010 million through *Materiel Acquisition Agreements* with Defence, and another $5,089 million through *Materiel Sustainment Agreements*. In addition, there are several *Shared Services Agreements* (for which no payment is made) that cover such services as payroll, accommodation, and banking services provided by Defence, and contracting policy and advice provided by the DMO. A useful breakdown of the payments to DMO appears on page 26 of the PBS. It includes the amount of money to be spent on various categories of acquisitions and sustainment support.

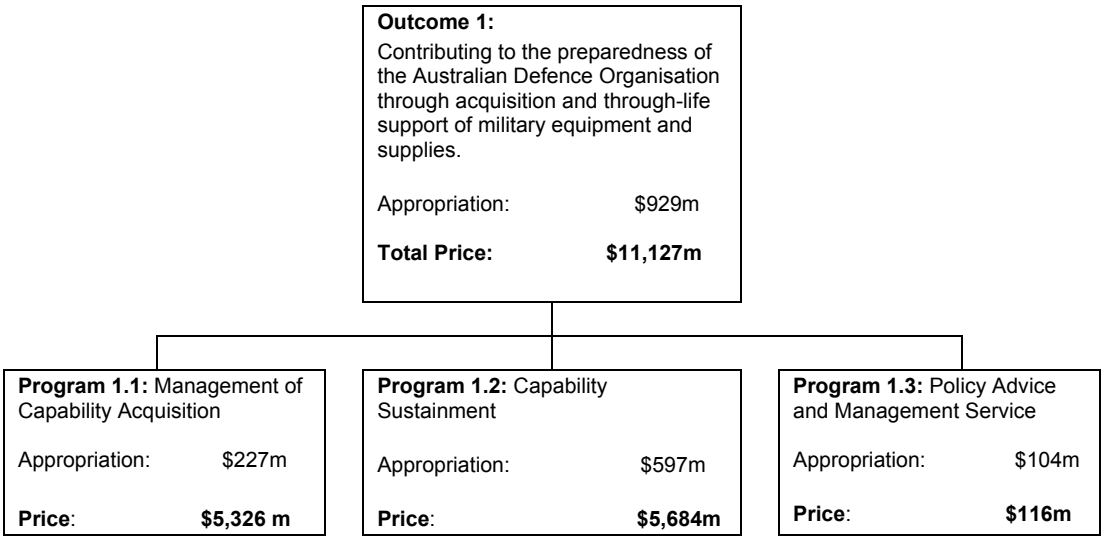
In 2011-12, DMO will make use of an unknown number of permanent and reserve military personnel whose salaries and other personnel expenses are counted in Defence's financial statements. DMO pays Defence for the services provided by these personnel, as a suppliers expense (rather like payments made to companies for contractor staff). In 2011-12 DMO will pay $440 million to Defence for military personnel and other costs covered by the Defence-DMO Service Level Agreement.

Outcomes and programs [p. 153]

As a prescribed agency DMO has its own outcome/program structure as detailed in Figure 2.8.2.

The first two programs are predominantly funded through the Materiel Acquisition and Sustainment Agreements with Defence, while the third is mainly funded through the Departmental Appropriation. Note that DMO refers to the 'price' of outputs rather than 'net cost' as in Defence.

Figure 2.8.2 DMO Output prices 2011-12



Source: 2011-12 PBS

Outcome and planned performance [p. 154]

The PBS sets performance targets for the three DMO outputs and outlines how they will be evaluated. We have reproduced the essential features in Table 2.8.3.

Table 2.8.3: DMO program objectives performance indicators

Program	Objective	Performance Indicators
Program 1.1 **Management of Capability Acquisition**	Acquisition projects will be delivered, in a transparent and accountable manner, on time, within budget and to the required standard as identified in the specific Materiel Acquisition Agreements.	The indicators vary with each project and are specified in the Materiel Acquisition Agreements.
Program 1.2 **Capability Sustainment**	The ADF and its capabilities will be sustained to meet operational requirements as identified in the specific Materiel Sustainment Agreements.	Indicators are included in individual Materiel Sustainment Agreements. The DMO reports to its customers against these.
Program 1.3 **Policy Advice and Management Services**	The DMO will meet Ministerial, government, Defence and DMO expectations and timeframes for the provision of policy, advice and support.	The DMO meets Ministerial, government, Defence and DMO expectations and timeframes for provision of policy, advice and support.

Management of Capability Acquisition – Program 1.1
Each of the major acquisition projects undertaken by DMO has a Materiel Acquisition Agreement with Defence that specifies scope, schedule and budget. The PBS summarises the top-30 acquisition projects by expenditure in 2011-12 (see top-30 projects below). Agreements also exist to cover the minor acquisition projects DMO manages.

Capability Sustainment – Program 1.2
On pages 186 to 199, the PBS details the goals and challenges for 2011-12 in the area of capability sustainment. Such detail, which was first provided in the 2005-06 PBS, gives a useful insight into the range of activities undertaken. In general, capability sustainment includes repair and maintenance, engineering, supply, configuration management and disposal, as well as the provision of spares, technical data, support and test equipment, training equipment and explosive ordnance. For the fifth year in a row, the top-20 sustainment products by weapons system has been given [PBS Table 91 p. 187], we discuss this new information below.

Policy Advice and Management Service – Program 1.3
This includes contracting and procurement policy advice for Defence and the DMO, industry policy and advice to Defence and the government, and corporate reporting requirements. Key performance targets for this output are given on page 197 to 199 of the PBS and relate primarily to advice to government and effective corporate governance and reporting.

The 'Top Twenty' sustainment products

The top 20 sustainment activities for DMO by forecast expenditure from Table 91 in the PBS are listed in Table 2.8.4, 2.8.5, 2.8.6 and 2.8.7 along with derived figures based on planned rates of effort. These include per-platform and per-flying-hour costs. Where possible, comparisons with previous year's costs have been included.

Table 2.8.4: Top 20 sustainment products – aerospace and helicopters

	Number	Cost ($m)	Hours flown	Annual cost per platform ($ million)	Cost per flying hour ($ '000)
Super Hornet*	24	110	4800	4.58	22.9
AP-3C Orion	19	111	7900	5.84	14.1
F/A-18 Hornet	71	187	13000	2.63	14.4
Hawk LIF 127	33	89	7500	2.70	11.9
C-130J	12	78	7350	6.50	10.6
C-130H	12	57	3200	4.75	17.8
C-17		57	4500	14.25	12.7
MRH-90	15	104	3000	6.93	34.7
Seahawk	16	63	4200	3.94	15.0
Black Hawk	34	96	8100	2.82	11.9
ARH Tiger	22	96	6635	4.36	14.5
AEW&C	6	171	2600	28.5	65.8

Source 2011-12 PBS

Table 2.8.5: Recent budgeted sustainment costs per unit – aerospace and helicopters

	Cost per aircraft ($ million)					Cost per flying hour ($ '000)				
	07-08	08-09	09-10	10-11	11-12	07-08	08-09	09-10	10-11	11-12
Super Hornet			0.67	2.58	4.58			39.3	29.5	22.9
AP-3C Orion	6.37	6.90	6.16	6.32	5.84	16.1	16.4	15.2	15.2	14.1
F/A-18 Hornet	1.68	1.61	1.70	1.75	2.63	10.5	10.2	10.1	9.5	14.4
Hawk LIF 127	2.88	2.70	2.64	2.70	2.70	15,2	13.6	13.5	11.1	11.9
C-130J	5.42	9.42	9.25	6.17	6.50	14.1	15.7	16.2	10.1	10.6
C-130 H		6.25	0.00	4.50	4.75		22.2		16.9	17.8
C-17	13.75	9.75	10.75		14.25	26.2	11.6	12.7		12.7
MRH-90		47.50	4.27	5.20	6.93		780.1	146.8	52.0	34.7
Seahawk	4.94		4.94	4.56	3.94	31.1		23.2	20.3	15.0
Black Hawk	1.97	2.15	3.03	2.91	2.82	10.6	10.2	12.7	11.5	11.9
ARM Tiger			3.77	3.91	4.36			46.2	20.7	14.5
AEW&C				23.5	28.5				70.5	65.8

Source: DAR, 2010-10 PAES, 2011-12 PBS

The above figures need to be treated with caution. Various fleets enjoy different amounts of contracted support (the cost of which is included) and manpower support from Defence's own workforce (which is not included). More generally, there are usually other costs (like fuel) that are not included separately for each platform. Also, one-off costs can heavily influence the results, including when platforms are first being brought into service. It will be some years before useful trends emerge.

Table 2.8.6: Top 20 sustainment products – maritime

	Number	2007-08 ($m)	2008-09 ($m)	2009-10 ($m)	2010-11 ($m)	2011-12 ($m)
Collins- subs	6	322	324	325	399	443
Anzac frigate	8	219	301	206	177	211
FFG Frigate	4	103	115	113	101	106
Mine Hunter Coastal	6	61	61	-		

Source: DAR, 2010-11 PAES, 2011-12 PBS

Table 2.8.7: Top 20 sustainment products – miscellaneous

	2007-08 ($m)	2008-09 ($m)	2009-10 ($m)	2010-11 ($m)	2011-12 ($m)
ADF Clothing and Equipment	117	89	84	52	
ADO Commercial Fleet	73	75	59		62
B Vehicles	117	127	115	90	79
Explosive ordnance	357	360	324	261	308
Wide Area Surveillance	77	79	76	82	88
Battlespace Communications	32	51			
Fuels and Lubricants	422	419	318	400	478
Protected Mobility Fleet				17	

Source: DAR, 2010-11 PAES, 2011-12 PBS

It is interesting to note the downward trend in some categories of sustainment expenditure, including explosive ordnance and, encouragingly, many of the RAAF aircraft fleets.

People

The DMO workforce is a mixture of military personnel, civilians and contractors. Unfortunately, military numbers were not disclosed in this year's PBS. The available information is collected in Table 2.8.8.

The civilian and military personnel in DMO are held under slightly different arrangements. Civilians in DMO are Defence employees and the CEO of DMO has delegations from the Secretary of the Department that he exercises in this regard. The expenses associated with DMO's civilian workforce appear in their financial statements as employee expenses.

In contrast, the military personnel in DMO are provided through a purchaser-provider arrangement with Defence. This does not cover the full per-capita cost of the military personnel, but rather represents a payment for their services roughly corresponding to their costs exclusive of allowances and overheads specific to their military role (and this is broadly commensurate with what would be needed to secure similar skills in the labour market). Thus, if the military fail to deliver sufficient personnel (due, for example, to operational demands or shortages) DMO has the money to hire people from outside. Note that the budgeted and estimated personnel figures for DMO represent a *maximum ceiling* and that DMO will only engage the staff necessary to perform acquisition and sustainment tasks that arise in future years.

Table 2.8.8: Workforce summary for DMO (average funded strength)

	04–05 Actual	05–06 Actual	06–07 Actual	07–08 Actual	08–09 Actual	09–10 Actual	10-11	11-12	12-13	13-14	14-15
Navy	306	277	281	277	296	303	303				
Army	461	411	389	386	404	412	418				
Air Force	770	762	763	794	808	802	803				
subtotal	**1,537**	**1,450**	**1,433**	**1,457**	**1,508**	**1,794**	**1,525**				
Civilian	4,363	4,502	4,951	5,304	5,552	5,526	5,510	5,647	5,744	5,874	6,096
Reserve	125	191	249	311	?	?	82				
PSP	388	393	298	181	176	120	24	51	48	48	48
Total*	**6,288**	**6,345**	**6,682**	**6,942**	**7,236**	**7,735**	**7,141**				

Source: DAR, 2010-11 PAES and 2011-12 PBS.
*Total excludes reservists.

The 'Top Thirty' projects

The PBS lists the top 30 major capital investment projects by 2011–12 expenditure [PBS Table 85 page 159] and provides a description of each. We reproduce the top-30 projects in Table 2.8.9 below. This year, ASPI has again commissioned a team of defence specialist journalists to prepare reports on interesting recent and current projects (see Chapter 8 of this Brief). The PBS also includes a listing of previously approved top-30 projects that is useful [Table 87, p. 175]. The estimated slippage in the gross program is 15%—about the same as last year. However, and as the PBS notes, the reliance on a relatively small number of large projects makes the outcome sensitive to how each of these large projects performs.

Table 2.8.9: Top 30 Defence Major Capital Investment Projects (million $)

Project	Project Number	Approved Project Expenditure	Spend to 30 June 2010	2011-12 Budget Estimate
General Manager Systems				
Aerospace Systems Division				
Bridging Air Combat Capability	AIR 5349 Phase 1	3,537	2,635	177
Air-to-Air Refuelling Capability	AIR 5402	1,838	1,378	235
F/A-18 Hornet Upgrade	AIR 5376 Phase 2	1,925	1,544	90
C-17 Globemaster III	AIR 8000 Phase 3	1,852	1,320	49
Airborne Surveillance for Land Operations	JP 129 Phase 2	98	29	34
Electronic Systems Division				
Next Generation Satellite Program	JP 2008 Phase 4	898	402	135
Battlespace Communications Systems (LAND)	JP 2072 Phase 1	267	103	109
Battle Management System	LAND 75 Phase 3.4	329	84	101
Ultra High Frequency Satellite Communications	JP 2008 Phase 5A	410	235	84
Dismounted Battlegroup and Below Command, Control Communication System	LAND 125 Phase 3A	113	24	53
Joint Command Support Environment	JP 2030 Phase 8	147	84	30
New Air Defence Command and Control Systems	AIR 5333	274	224	30
Explosive Ordnance Division				
Follow-on Standoff Weapon	AIR 5418 Phase 1	396	249	43
Lightweight Torpedo Replacement	JP 2070 Phase 3	303	239	29
Lightweight Torpedo Replacement	JP 2070 Phase 2	184	104	29
Helicopter Systems Division				
Multi Role Helicopter	AIR 9000 Phase 2	3,748	1,903	393
Armed Reconnaissance Helicopter	AIR 87 Phase 2	2,060	1,754	118
Human Resources and Corporate Services				
ADF Deployable Logistics Systems	JP 2077 Phase 2B.2	130	18	29

Land Systems Division				
Overlander Field Vehicles and Trailers	LAND 121 Phase 3	3,278	123	136
Artillery Replacement 155mm Howitzer	LAND 106 Phase 1A	333	74	111
Upgrade of M-113 Armoured Vehicles	LAND 106	885	710	100
Counter Rocket, Artillery and Mortar (C-RAM)	LAND 19 Phase 7A	263	64	85
Bushmaster Infantry Mobility Vehicle	LAND 116 Phase 3	930	677	67
ASLAV – Additional	LAND 112 Phase 3	693	599	34
Maritime Systems Division				
Anzac Anti-Ship Missile Defence	SEA 1448 Phase 2B	462	299	59
Standard Missile Replacement (SM-1)	SEA 1390 Phase 4B	617	301	90
Deputy CEO				
Air Warfare Destroyer Program				
Air Warfare Destroyer – Build	SEA 4000 Ph3	7,951	3,076	841
Airborne Early Warning and Control System				
Airborne Early Warning and Control Aircraft	AIR 5077 Phase 3	3,884	3,013	401
Amphibious Deployment and Sustainment				
Amphibious Deployment and Sustainment	JP 2048 Ph4A/4B	3,122	1,509	707
New Air Combat Capability				
Detailed Analysis and Acquisition Planning	AIR 6000 Phase 2A/2B	2,755	66	65
TOTAL TOP 30 APPROVED PROJECTS		**43,682**	**22,841**	**4,465**
Other Approved Project Estimate				649
Total Program				5,114
Management Margin (14% slippage)				-785
Net from existing projects				4,329
Projects Planned for Government Approval				647
Total Funds Available				**4,976**

Source: 2011-12 PBS

CHAPTER 3 –DELIVERING THE 2009 WHITE PAPER

This Chapter deals with defence funding and the delivery of the 2009 Defence White Paper. It is divided into four parts: (1) a brief survey of Australian defence funding from the mid-1980s through to 2009; (2) an analysis of defence funding since the 2009 Defence White Paper; (3) an assessment of progress made towards delivering the White Paper's goals; and (4) a discussion of the affordability of the White Paper and the risks to its delivery.

For ease of reference, we shall refer to the 2000 and 2009 Defence White Papers as *Defence 2000* and *Defence 2009* respectively. Readers interested in a more detailed historical survey should consult the obituary for *Defence 2000* in Chapter 3 of the 2009-10 ASPI Budget Brief.

Defence funding from the 1980s to 2009

The late 1980s and 1990s were lean years for Defence. Apart from fluctuations due to foreign exchange movements and operational supplementation, defence spending was kept more-or-less constant in real terms across the period. In fact, the Defence budget was higher in 1985-86 ($14.5 billion) than it was eleven years later in 1996-97 ($13.7 billion) as measured in real 2008-09 dollars.

Because the cost of maintaining military capability exceeds inflation by 2–3%, the Defence budget came under growing pressure as the years went by. To try to close the gap between means and ends, successive governments pursued 'efficiency' programs of one sort or another through the 1990s (see Chapter 4 of the 2009-10 ASPI Budget Brief for further details).

Nonetheless, by the end of the decade Defence was in a sad state: the permanent force had shrunk by more than 20,000 positions compared with the mid-1980s; a 'train wreck' of block obsolescence was getting closer with no money in sight for modernisation; the preparedness of the force was poor with many 'fitted-for-but-not-with' platforms and others badly in need of upgrade; and logistics was hollow and underfunded. It was against this background that the then government decided to develop a White Paper in 1999 with the aim of putting Defence planning and funding on a sustainable footing.

The tumultuous events in East Timor in 1999 delayed the White Paper until the end of 2000. But it was perhaps a delay worth having. East Timor was the largest Australian operation since Vietnam and it stretched parts of the defence force severely. In the process, serious shortcomings were exposed in equipment, logistics and preparedness. It is unlikely that the government would have been as generous in 2000 without the experience of the East Timor operation.

The 2000 White Paper

The only Defence White Paper produced by the previous government, *Defence 2000*, sought to achieve a coherent package of strategy, capability and funding for Australia's defence for the decade 2001-02 to 2010-11. On the capability side, a *Defence Capability Plan* (DCP) was published that detailed 165 separate phases of eighty-eight capability proposals, valued at around $50 billion, planned for the forthcoming decade.

The entire package, including new and pre-existing capability, was funded through a decade-long funding envelope that roughly equated to 3% average annual real growth. Although earlier White Papers had suggested near-term funding levels, never before had a decade-long funding commitment been made—let alone one with a talisman-like goal of '3% real growth'.

Defence 2000 provided more than $30 billion spread across four categories, including; $21 billion for the purchase of major capital equipment; $3.2 billion to cover the through-life support costs of new capabilities planned to enter service as a result of the DCP; $5 billion to cover an expected annual 2% growth (above inflation) in personnel costs and $1 billion to augment the operating cost baseline in the Defence budget. In addition, Defence was allowed to retain within its annual funding base around $450 million of unspent operational supplementation from East Timor.

The 3% funding commitment was extended out to 2017-18 in the 2006 and 2008 budgets. Before turning to look at these and other funding measures from the last decade, it's worth pausing to look back at *Defence 2000* and ask how far Defence has got in delivering the goals set for it.

At the risk of oversimplification, *Defence 2000* sought to achieve four things: (1) modernise the ADF by replacing or upgrading ageing assets and introducing new capabilities in select areas; (2) improve the preparedness of the ADF so that it was made up of 'fully developed capability' rather than hollow units and fitted-for-but-not-with platforms; (3) boost the capability of the ADF to undertake expeditionary operations in the immediate region; and (4) sustainably align Defence plans and funding.

Of the four goals, the modernisation of the ADF was the least successful. Persistent and widespread delays in the approval and execution of defence acquisitions delayed the delivery of many capabilities, with delays of 4-5 years not uncommon. In part, this reflected a systematic underestimation of costs which ensured that there was never going to be enough money to deliver all that was planned. Further delays arose due to insufficient industry capacity, tardy approval of new acquisitions and all too frequent technical problems with equipment under development. In fact, the combination of delayed approvals and delayed projects saw Defence unable to spend all the money it had been given to buy new equipment. Over the period covered by *Defence 2000*, we estimate that at least $4.4 billion of planned investment was deferred. The actual figures are probably higher but we cannot be sure because the full extent of the deferrals was not disclosed in the 2009-10 Budget.

One area where Defence can claim success is in improving the preparedness of the defence force. While problems remain in some areas such as the submarine and amphibious forces, the trend over the past decade has been favourable. Not only is the ADF now more ready and able to mount and sustain deployments—as evidenced by its current high operational tempo—but within Defence, the management and internal reporting of preparedness is much better than it was a decade ago. Similarly, the capacity of the ADF to conduct expeditionary operations in our immediate region is better now than at any time since the Vietnam conflict.

As for putting Defence finances on a sustainable footing, it was not long before Defence was struggling to deliver the outcomes sought by *Defence 2000* within the

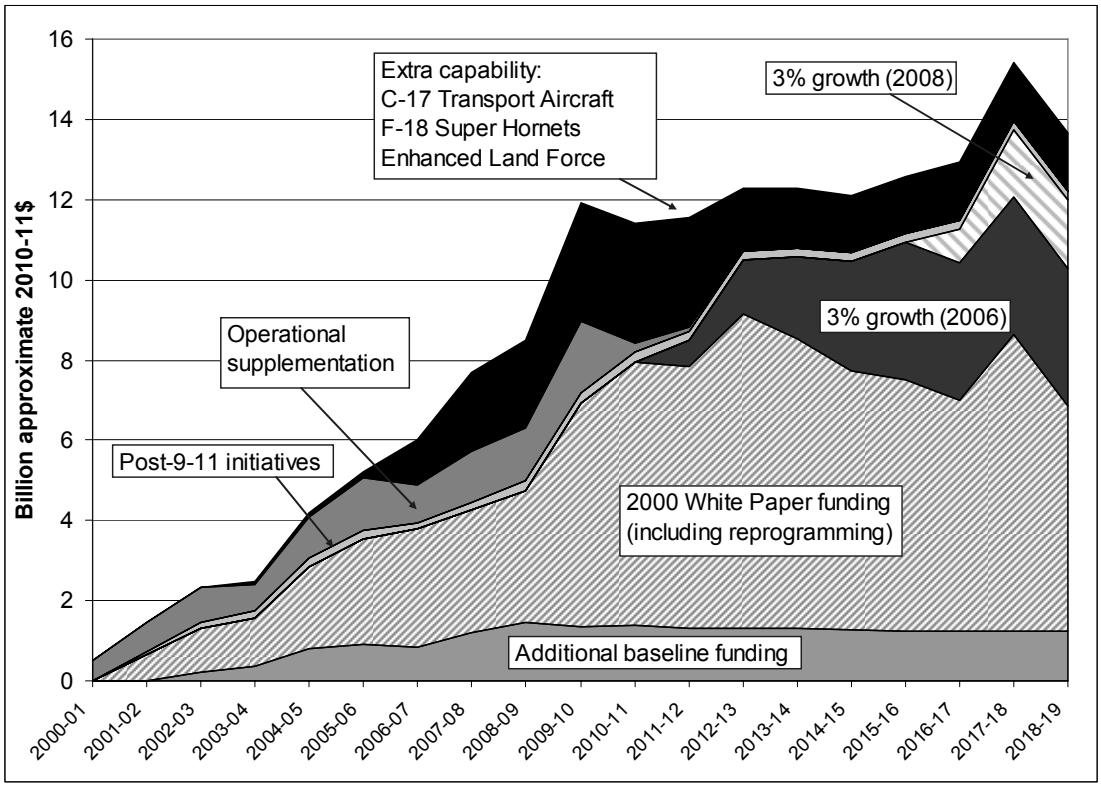
funding provided. In 2003 an internal Defence Capability Review recommended cuts to the force structure to contain costs, including the decommissioning of two FFG frigates, the early retirement of the F-111 fleet and the laying up of two mine-hunting vessels. But these cuts failed to bring the books into balance and from 2005 onwards additional funds (amounting ultimately to around a $1 billion a year) were made available to Defence to manage the baseline cost of personnel, estate and logistics. At the same time, savings measures of $200 million a year were imposed on Defence to redirect money towards combat capability.

Boom times: 2002-2008

Bridging the gap between the means and ends of *Defence 2000* was only the start of the government's generosity to Defence. From around 2006, the previous government provided additional money for a range of new capability initiatives, including four C-17 transport aircraft ($3.2 billion), twenty-four F/A-18F *Super Hornet* strike fighters ($6 billion), and the Enhanced Land Force initiative that will add two infantry battalions to the Army at a cost of $10 billion over a decade. This additional funding came on top of that provided for new and expanded capabilities in the aftermath of 9/11 and the deployments that followed.

Because official budget figures are invariably given in 'out-turn' format that anticipates future inflation and foreign exchange rates, it is difficult to give a definitive figure for the value of additional funds provided post 2000. The best we can do is to capture the scale of funding using the historical values that appeared in the budget papers at the time, converted to 2010-11 dollars. The result appears in Figure 3.1.

Figure 3.1: Additional funding including 2000 White Paper and subsequent 3% growth



Source: ASPI analysis of budget papers and DAR, CPI inflation used

Despite all the money flowing into Defence, it remained unclear whether adequate funds were available pre-*Defence 2009* to deliver the capabilities sought at that time. On one hand, it looked like not enough money had been set aside to crew and operate the raft of new capabilities under development—hence the $10 billion savings program announced in early 2008. On the other hand, Defence was unable to spend the money it had for both investment and recurrent spending. So much so, that they were directed to absorb $1.1 billion of measures in 2008-09 following an abnormally large windfall from price supplementation (and the embarrassing hand back of $830 million of unspent funds from 2007-08). This was the confusing state of Defence funding prior to the release of *Defence 2009*.

The 2009 Defence White Paper and beyond

On 3 May 2009, the Prime Minister released the long-awaited 2009 Defence White Paper. Entitled *Defending Australia in the Asia Pacific Century: Force 2030* the 138-page document included one and half pages—585 words to be precise—on how the government planned to fund Defence over the next 21 years. The plan had two parts.

First, a funding model with the following elements:

- 3 per cent real growth in the Defence budget to 2017-18
- 2.2 per cent real growth in the Defence budget from 2018-19 to 2030
- '2.5 per cent fixed indexation to the Defence budget from 2009-10 to 2030
- that Defence will reinvest savings from its [$20 billion decade-long] Strategic Reform Program back into priority Defence capabilities as agreed by the Government
- shortfalls against the White Paper funding plan will be offset by Defence.

Second, 'Defence [will] undertake a substantial program of reform, efficiencies and savings to underpin the achievement of White Paper objectives... [and] correct long-term hollowness and remediate the enabling functions of the Australian Defence Force'. This is, of course, the aforementioned $20 billion Strategic Reform Program.

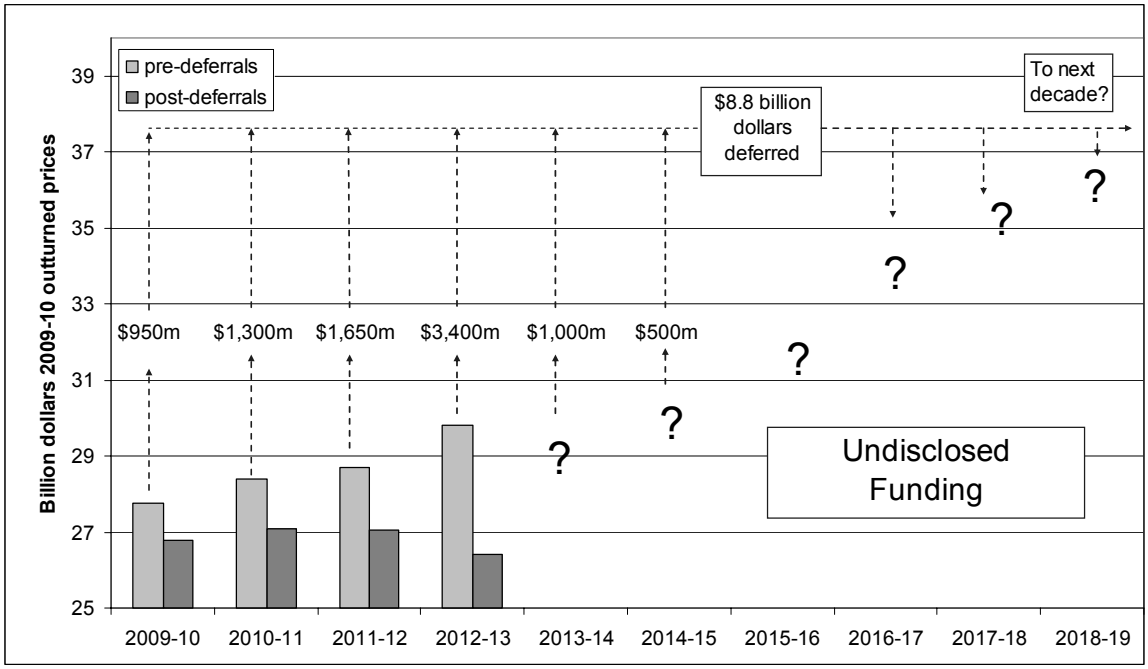
Further detail was provided eight days later in the 2009-10 Budget. And, while the wording of the funding commitment in *Defence 2009* was retained, the government stopped short of handing over the money. Instead, a substantial wedge of promised funding was deferred into the future. As best we can work out (the 2009-10 budget was less clear than it could have been) the net result was:

- the new funding model added in excess of $10.5 billion over the decade, including $5.3 billion in the first four years
- $8.8 billion was deferred within the decade, including $6.8 billion in indexation from the first six years along with another $2 billion from the first four years
- the eighth, ninth and tenth years of the decade received some deferred funds, with the remainder pushed into the next decade.

Figure 3.2 depicts the deferral of funding that occurred in the 2009-10 Budget. In addition to this deferral and the imposition of the decade-long $20 billion savings program, Defence was also directed to 'absorb' additional new budget measures

amounting to $585 million over four years and $1.7 billion over the decade in the 2009-10 Budget.

Figure 3.2: Defence funding as inferred from the 2009-10 PBS



Source: ASPI analysis of budget papers

Last year's budget preserved previously-planned defence funding, apart from $1.4 billion in routine defence supplementation for operations and adjustments due to foreign exchange movements. However, Defence was once again required to absorb the cost of new measures, amounting to $912 million over the next four years and $1,084 million over the decade.

As explained in Section 2.2, following a $1.5 billion return of funds in 2010-11, defence funding across the next decade has been cut (not deferred) by $3.9 billion. In addition, $2.4 billion of capital investment funding has been deferred to beyond 2014-15. Table 3.1 collects these and other major changes to Defence funding since the release of *Defence 2009*.

Table 3.1: Key budget initiatives 2009-2011

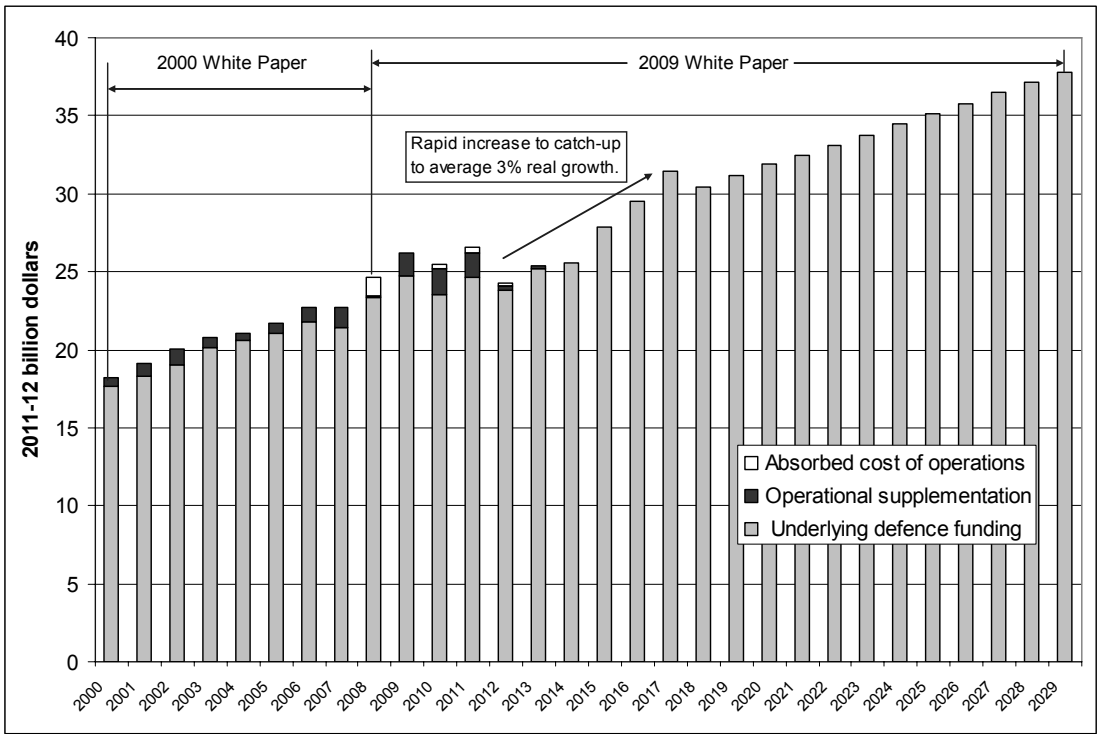
Year	Initiative	Cost
Deferrals		
2009	Deferral of funding to beyond 2015-16	$8,800 million
2010	Deferral of investment funding to beyond 2015-16	$521 million
2011	Deferral of investment funding to beyond 2014-15	$2,400 million
	Total	**$11,721 million**
Cuts		
2011	Savings measures (including $400 million hand back in 2010-11)	$4,300 million
	Total	**$4,300 million**
Absorbed costs		
2009	Costs absorbed 2009-10 to 2018-19	$1,680 million
2010	Cost of force protection ($912 m) – Cost of existing projects ($402 m)*	$510 million
2011	Cost of HMS Largs Bay ($277 m) and additional C-17 ($333 m)	$610 million
	Total	**$2,800 million**

*Senate question on notice #140, September 2010.

In Table 3.1 the total value of 'absorbed' initiatives has been included wherever they are not clearly offset by a reduced impost to deliver something else at another time. For example, only around half of the absorbed cost of force protection measures has been included because it removed the need for some projects previously planned for later in the decade.

Neither *Defence 2009* nor any of the subsequent Budgets disclosed the actual level of planned defence funding beyond the forward estimates period. Fortunately, in February 2010 the government's Intergenerational Report provided a graph of long-term defence funding as a share of GDP from which it is possible to calculate defence spending. Taking into account decisions from the last two budgets, the updated result appears in Figure 3.3. Given the difficulties in mapping one data source to another, the result is indicative rather than precise.

Figure 3.3: Indicative Defence funding 2000 to 2029



Source: 2010 Intergenerational Report, 2010-11 Budget Papers and Defence PBS.

Despite the cuts and deferrals, the planned underlying real growth in defence spending (exclusive of operational supplementation) in Figure 3.3 is largely consistent with the promised 3% and 2.2% rates. Specifically, from 2000-01 to 2008-09 the average rate of growth was 3.6%, from 2009-10 to 2017-18 the average rate of growth is planned to be 3.5%, and from 2017-18 to 2029-30 the rate of growth is projected to be 1.5%. The shortfall in the last figure results from the 2010 deferral of $521 million to 2017-18.

However, the recent deferrals of funding will create a challenge post 2012-13. Indeed, over the period 2012-13 to 2017-18, underlying defence funding needs to grow by 32% in a period of only five years—corresponding to an average of almost 6% per annum. As we'll see, because a large share of this additional money is designated for capital investment, it is highly doubtful that either Defence or industry has the capacity to achieve such rapid growth.

Delivering 'Force 2030'

Even if the government and its successors maintain the funding promised in *Defence 2009,* the plan to deliver *Force 2030* is far from assured. The unambiguous lesson of the past decade was that while planning for new capability is easy, delivering it can be very difficult. In fact, it is already clear that the new capabilities envisaged in the White Paper will not enter service as planned. Only two years after the 2009 White Paper and major equipment acquisition projects are neither being approved nor delivered on schedule. The factors influencing the approval and delivery of projects are explored below.

Approval and commencement of projects

Before an item of major capital equipment can be purchased, the acquisition has to be approved by the National Security Committee of Cabinet or, for projects valued less than $100 million, by the Ministers for Defence and Finance. Under the arrangements introduced following the 2003 Kinnaird Defence Procurement Review, each major project is considered twice. Initial approval (known as first pass) allows a project to begin planning in earnest, including by collecting information on potential options. Some time later, final approval (second pass) is sought to allow a project to proceed to contract with a supplier.

Unfortunately, the schedule for first and second pass approval of major capital investment projects in the 2009 DCP is already well behind schedule. Consider the difference between planned and actual achievement for 2009-10 (the first year of the White Paper) in Table 3.2. While 64% of planned second pass approvals were achieved plus two unplanned approvals, only 24% of first pass approvals were approved on schedule.

Table 3.2: Progress of the 2009 DCP during 2009-10

	Planned	Approved on schedule	Unplanned approvals
1st pass approvals	15*	2 (13%)	2
2nd pass approvals	14*	8 (57%)	5

Source: *2009-10 PBS p.77-78, 2009-10 DAR p.340

Last year, we observed that the chances of catching up in 2010-11 were especially poor given the substantial reduction in money available to initiate new projects in the 2010-11 Budget. Defence subsequently dismissed this analysis claiming that *Force 2030* remained on track. However, with around 45 days now left in the 2010-11 financial year, the situation is not promising.

There is little point listing (as we did last year) the many individual projects that have been either deferred or are still awaiting approval this year. It suffices to observe that only six projects have received first-pass approval and ten have received second-pass approval.

However, of the ten second-pass approvals, only four were listed in the DCP, and two of these resulted from splitting a single phase of project into two parts. Of the remaining six projects not in the DCP that were approved, two were opportunity buys driven in part by the $1.5 billion investment underspend in 2010-11 (C-17 *Globemaster* and *Largs Bay* acquisitions), one is the additional purchase of

Bushmasters, and three are classified projects. As a result, the number of projects awaiting second-pass approval in the DCP has only been reduced by three. Advice from Defence is that a further eight projects will potentially be approved by the government this financial year. We do not know what the mix of first- and second-pass approvals is.

This year's PBS again fails to list those projects planned for approval in the next twelve months. Instead, in PBS Tables 44 and 45, we get an omnibus of projects that are being developed for approval over the next two to five years. This provides little help in assessing the progress likely in approving DCP projects over the next year.

At first glance, the public DCP is equally unhelpful. While specific years used to be provided for the planned approval of projects, there are now only multi-year brackets which obscure what's going on with individual projects. However, with a bit of work, it's possible to generate a clearer picture of plans for the overall program. This can be done by tabulating all the multi-year windows for the individual projects, and in the absence of more precise data, assigning an equal probability of an approval in each year of the window.

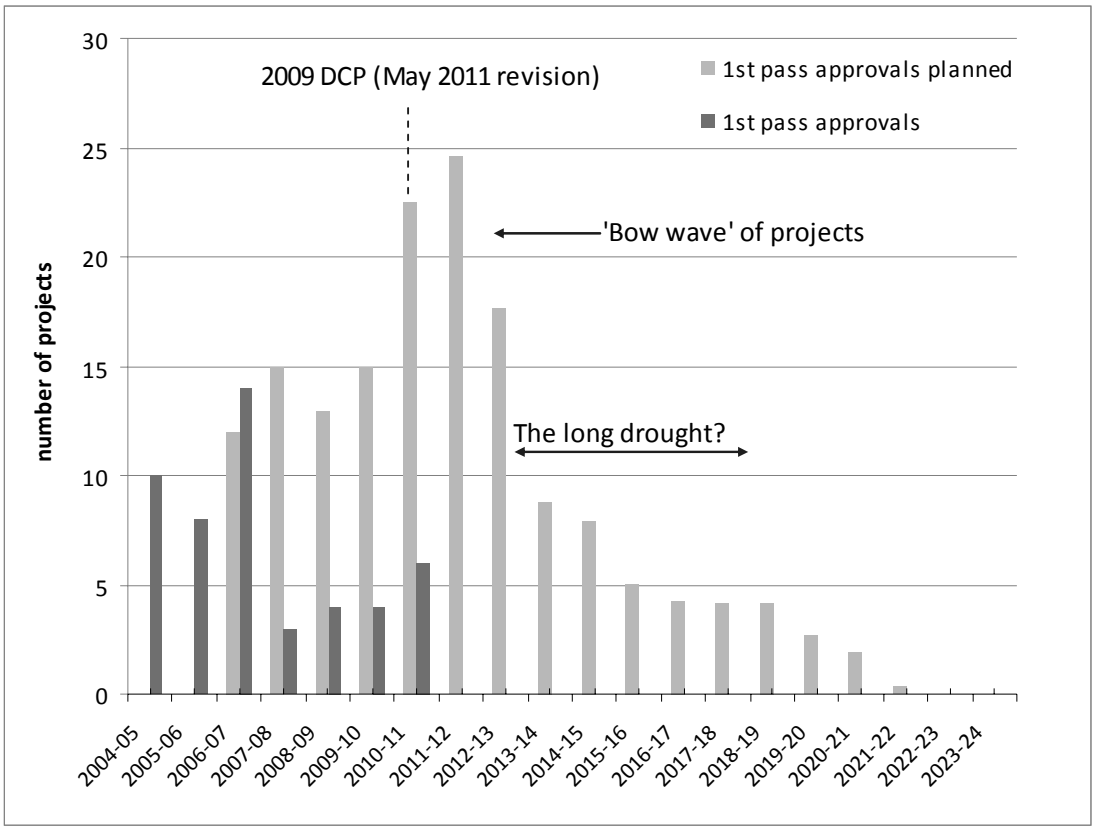
For example, if a project has a window of 2011-12 to 2012-13, it is assigned a 50% chance that it will be approved in each of the years. Weighting the probabilities for the 126 projects available in the December 2010 revision of the DCP in this way yields the project approval patterns in Figure 3.4 and 3.5. For comparison, previously planned and achieved approvals for the period 2004-05 to 2009-10 have been included. For consistency with past data, we've excluded classified projects but the remaining seven second-pass approvals for 2010-11 have been included even though they only involve three DCP projects. For this reason, Figure 3.4 overstates the progress made in implementing the DCP in 2010-11.

Note that in the DCP only three projects had approval dates listed as 'yet to be determined', and the deferred approval dates (disclosed at budget time) for AIR 5440 Ph2 and JP1544 Ph1 have been taken into account. Thus, we have a complete and up-to-date picture of Defence's plans as of mid-May 2011. Several points stand out from figures 3.4 and 3.5:

- The ongoing failure to approve projects has created a 'bow wave' of approvals over the next 3-5 years.
- As expected, because second-pass is contingent on first-pass, the peak of planned second-pass approvals occurs two years after that for first-pass.
- On the basis of recent experience, the planned approval of projects is manifestly unachievable.
- From the middle of the decade onwards, there is a drought of projects.

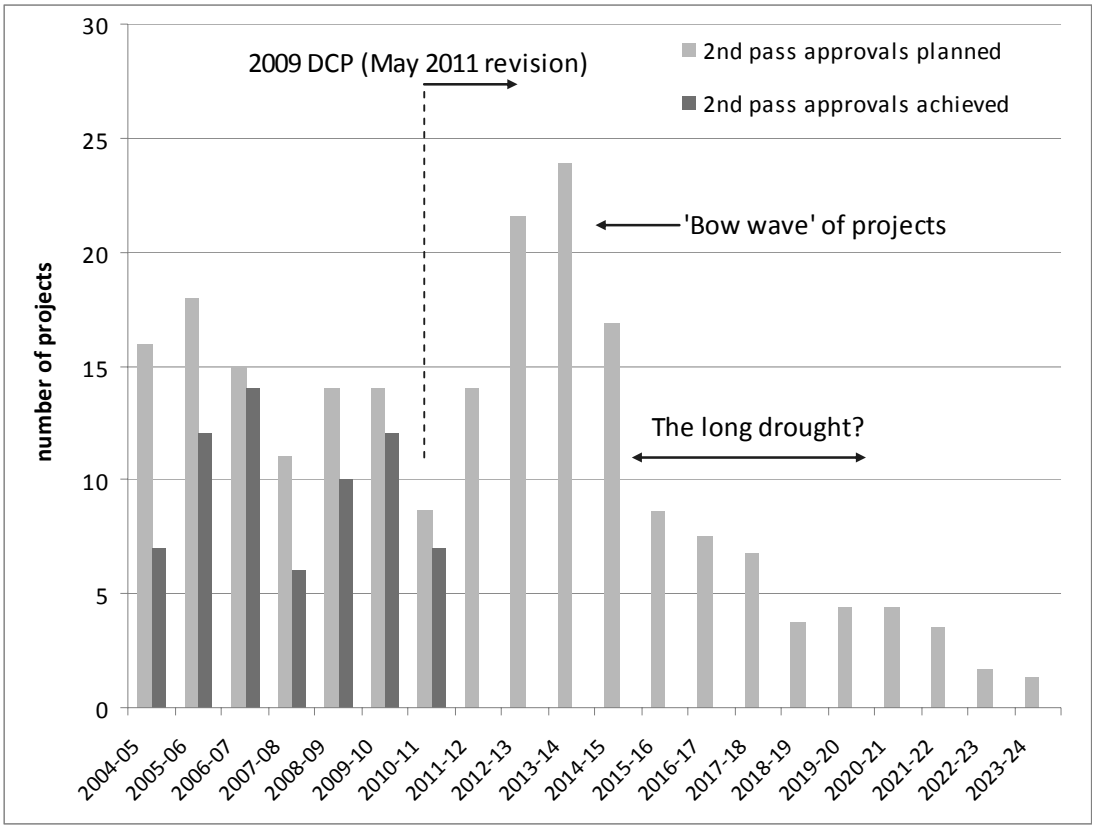
It is difficult not be alarmed by Defence's plans. Notwithstanding that there was an election in 2010 which disrupted government business for several months (a largely predictable disruption given the Electoral Act), is it realistic to plan on the basis that over the next thirteen months forty-one first-pass approvals and sixteen second-pass approvals will occur given that only six and seven of each have been achieved over the past 11 months (excluding classified projects not in the DCP)? And remember, these plans were updated at the time of the May Budget.

Figure 3.4: Projects planned for first-pass approval



Source: Past and current DCP, PBS and Annual Reports.

Figure 3.5: Projects planned for second-pass approval

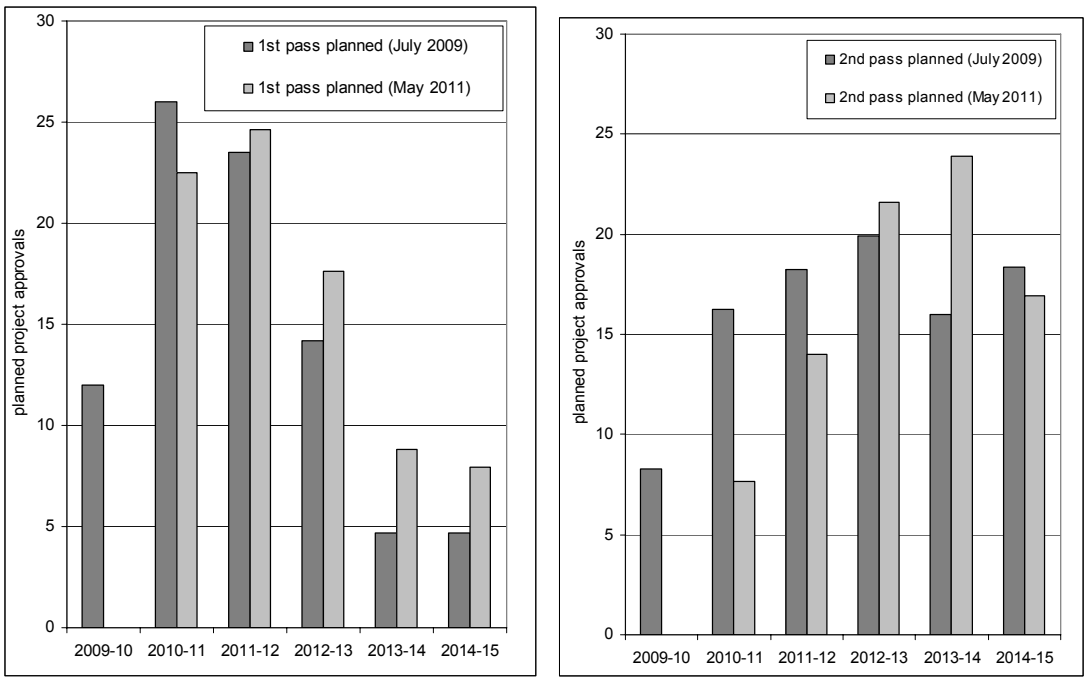


Source: Past and current DCP, PBS and Annual Reports.

Looking to the future, things only get worse. The public DCP is a rolling ten year program based on the classified DCP that extends twenty years into the future. How then can we have a situation where there are sixty-seven first-pass approvals needed over the next three years to meet the schedule but only eleven in the last three years of the decade? Although the planned increase in capital investment past 2012-13 goes part of the way to explaining an early block of approvals, the absence of projects in the latter half of the decade raises questions about the completeness and sustainability of Defence's investment plans. Defence advice is that it is likely that new projects will be identified through the next Force Structure Review—which still begs the question of the completeness of present plans.

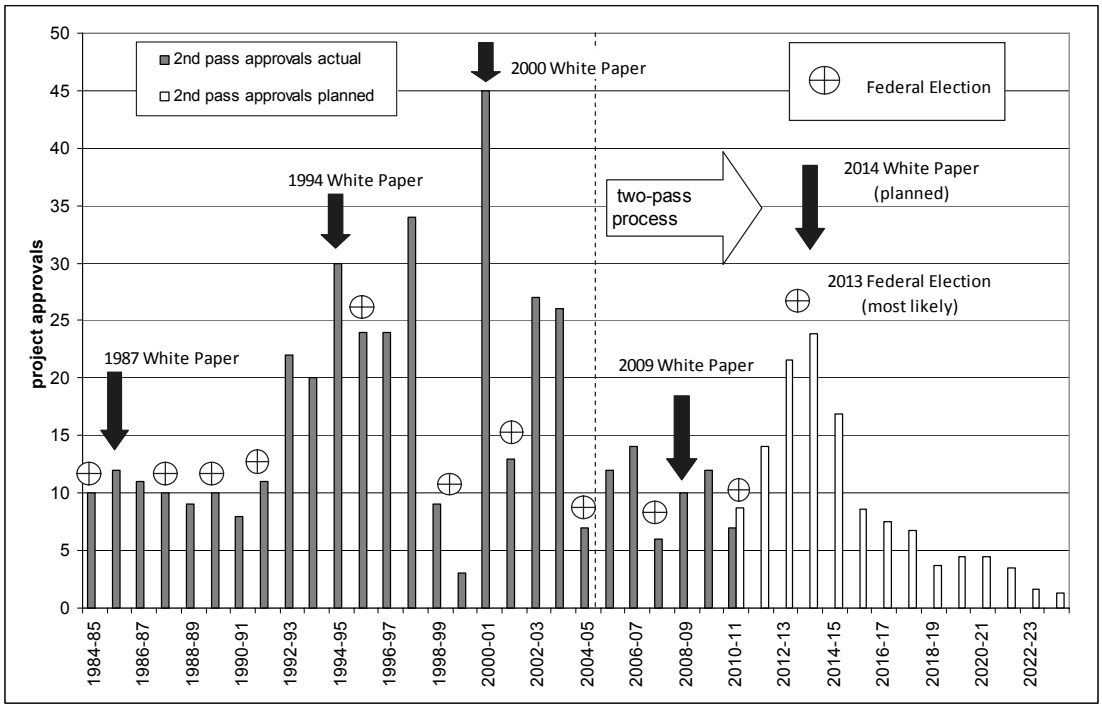
Although recent delays have exacerbated the challenge of approving a large number of projects in a short period of time, the problem can be traced back to the original 2009 DCP. As Figure 3.7 shows, the aggressive approval of projects in the early years of the program was largely built into the original plan.

Figure 3.6: Planned approvals July 2009 and May 2011



A comparison of historical patterns of project approval with current plans gives no cause for optimism. As Figure 3.7 shows, high approval rates commensurate to those planned have been achieved in the past, but not since the introduction of the more demanding two-pass process in 2004. Indeed, the usual surge in approvals following a White Paper simply did not occur in 2009. Moreover, Defence's present plan clashes badly with the election in 2013 (which historically reduces the number of approvals) and a White Paper in 2014 (which on past experience will be preceded by a substantial hiatus in approvals).

Figure 3.7: Planned approvals (second-pass); 1984 to 2022



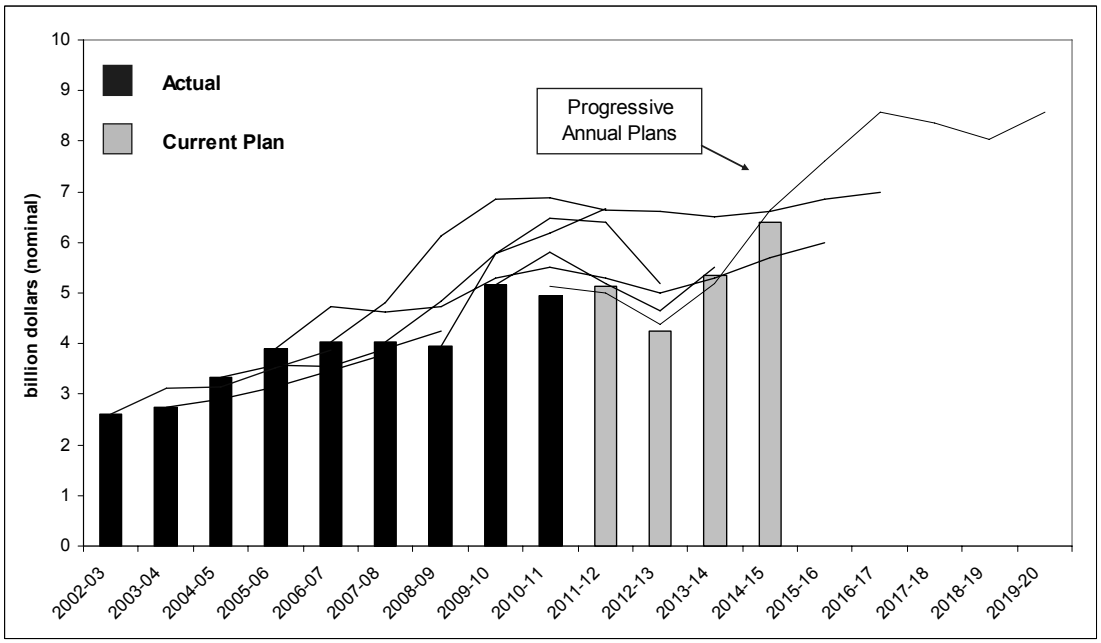
Source: DAR and 2009 DCP (May 2011 revision) , excludes classified projects.

Performance in delivering capital equipment

The critical path to expanding and modernising the ADF goes through the acquisition of major capital equipment. In this section we examine recent and historical trends in the Major Capital Investment program.

For more than a decade, Defence has struggled to deliver its plans for re-equipping the ADF. Prior to *Defence 2009*, around $4.4 billion of investment was deferred into the future. Successive plans and actual results are potted in Figure 3.8.

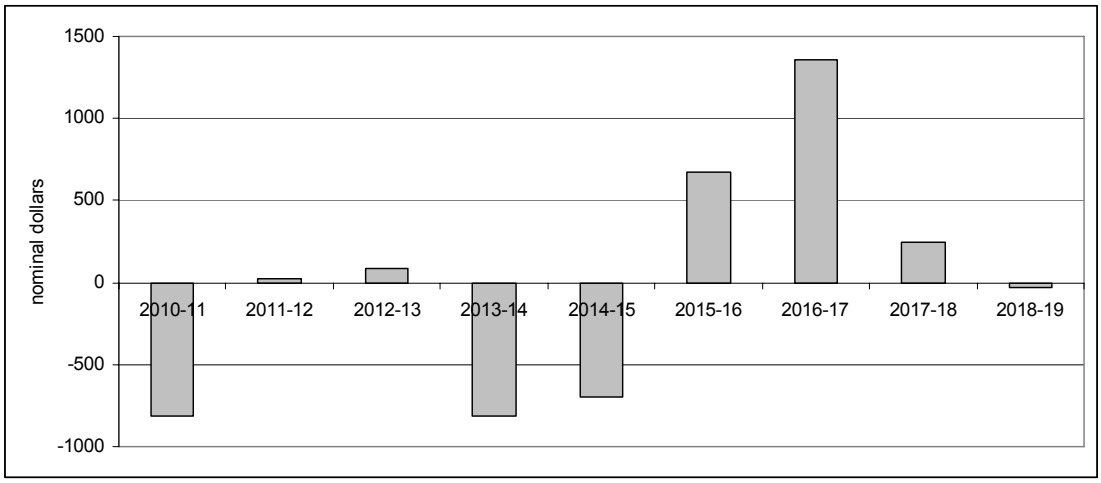
Figure 3.8: Major Capital Investment – plans and actual results



Source: PBS, DAR and speeches by Defence officials

Over the past two years, substantial funds earmarked for the Major Capital Investment program have been reprogrammed (deferred) into the future. Figure 3.10 presents our best estimate of the net movement of funding, assuming that the deferred $668 million on non- Major Capital Investment funding is spread evenly across the budget and forward estimates and repaid evenly thereafter.

Figure 3.9: Major Capital Investment – deferrals since May 2009



Source: PBS and DAR

According to a budget night media release, the most recent round of deferrals was necessary to accommodate 'anticipated delays in project delivery from industry'. However, while industry has to bear a substantial share of the responsibilities for the delays, it is not the sole cause. If it was, there would have been no need to defer a net of $213 million of funding earmarked for the unapproved major capital investment program to beyond the forward estimates. Moreover, a close examination of delays to individual projects in the 2010-11 PAES tells a more complex story. Of the $1.1 billion worth of delays reported, fully $200 million were 'good news'; including cost reductions and early payments in the previous reporting period. Of the roughly $900 million in 'bad news', our assessment is that there was a roughly 80-20 split of responsibility between industry and the Commonwealth. Our best estimate of the situation appears in Table 3.3.

Table 3.3: ASPI assessment of 'responsibility' for slippage

	Commonwealth	Suppliers	Unallocated
Positive	$64 million	$136 million	$23 million
Negative	$160 million	$746 million	

Source: ASPI assessment of information in the 2010-11 PAES

Just prior to the budget, the government announced a package of project management and accountability reforms. These include cost benefit analysis of non-off-the-shelf purchases, establishing project directives and a project performance office in DMO, regular reporting to government, and a more disciplined process for changing the scope of a project. In addition, the Auditor General has been asked to audit the implementation of the 2008 Mortimer Report into defence procurement and sustainment. These are all worthwhile initiatives.

With a new round of reforms now beginning, it's worth taking stock of what's been achieved. As we've seen in the last section, the two-pass process has been

accompanied by substantial delays on the approval of projects. The question is; what has been gained as a result? With this in mind, the next section employs publicly available data to explore trends in project delivery.

Historical trends

In an ideal world, the delivery of capital equipment would be measured in terms of cost, schedule and capability performance. Unfortunately, the information needed to cover all three dimensions is not generally available to the public (or ASPI), especially when looking back in time to see whether the delivery of equipment is improving or worsening. Although the ANAO *Major Project Report* will eventually be helpful, it has not been around long enough to reveal trends.

Cost

In recent years, project cost increases have been tabulated in the Defence Annual Report. There is little point reproducing the results here because—and here's the good news—major capital investment projects tend to be delivered within budget. That said; some scepticism is needed because budgets are sometimes preserved by reducing the scope of a project, either by reducing the number of assets (as with the FFG Upgrade, Bushmaster and HF Modernisation projects) or by accepting a lesser level of capability (as with the AEW&C and *Collins* projects). Nonetheless, cost increases are largely a malady for projects prior to approval rather than after (see, for example, Table 7.1 in *The Cost of Defence 2008-09*).

It's important to note that while cost increases are largely contained for approved projects (managed by DMO), this is not the case for unapproved projects (managed by the Capability Development Group in Defence). Instead, unapproved projects costs tend to increase from the point of entry into the DCP until approval.

Schedule

As a general rule, once projects are approved they take longer to deliver than first planned (they also take much longer to approve than was planned but that's another story). A 2008 study of forty relatively mature projects valued at greater than $200 million revealed an average delay of twenty-four months; see Table 7.5 in *The Cost of Defence 2008-09*. Schedule slippage on this scale is a serious issue. Not only does it create capability gaps in force structure for extended periods, but it wastes resources by having project teams working for years longer than expected.

So what difference have the post-Kinnaird procurement reforms made since 2004? Well, to start with, several recent off-the-shelf purchases such as the C-17 transport aircraft, Abrams tanks and F/A-18 *Super Hornets* have been delivered quickly and within schedule. Of course, this does not come as any surprise—buying established technology from established production lines is hardly a risky proposition. Moreover, each of these projects largely circumvented the new two-pass approval process and, arguably, the choice of off-the-shelf equipment had nothing to do with the reforms. So although these projects confirmed what common sense would say about buying off-the-shelf, they don't tell us anything about the efficacy of recent reforms.

Unfortunately, meaningful trends are difficult to discern because of the small number of project available. Moreover, it is dangerous to draw conclusions from recent projects such as the Air Warfare Destroyer and Amphibious Ships because they are

relatively immature. As a general rule, delays usually emerge towards the end rather than the beginning of a project's life.

What we can test, however, is whether the in-year management of projects has improved since the reforms began. That just requires using the only measure that has been reliably reported over time; project expenditure. Expenditure is not a perfect surrogate for progress. Payments can sometimes be made or withheld for a variety of reasons; for example, to manipulate spending within annual boundaries. Nonetheless, apart from pre-payments at the start of projects, payments should on average only occur when verified substantive progress has been made towards capability delivery. Nonetheless, some care is needed. In particular, comparing planned investment spending with actual investment is problematic because of 'overprogramming'.

Overprogramming is the practice of allocating less money (typically 10% to 20%) for the overall portfolio of projects in anticipation that there will be a systematic tendency to underspend during the year. A similar process occurs for unapproved projects. In both cases, over-programming is best thought of as a risk management tool.

As a result of over-programming, aggregate performance depends as much on the ability to anticipate the extent of slippage as it does on the management of the individual projects or the program as a whole. Moreover, in any given year the performance of a single large project can dominate the aggregate result. To complicate matters further, the allowance for slippage is not reliably available, especially for past years.

What is available over an extended period is the planned and actual expenditure on *individual* projects (typically the top 20 or 30). Within individual projects, figures are not overprogrammed and therefore reflect a project's anticipated and actual in-year performance. If projects really are being more carefully developed prior to approval, an improvement should be expected as newer projects replace the old. Similarly, the development of a more commercially adept and professional acquisition workforce should be reflected in improved in-year performance of projects old and new.

The simplest test is to look at the aggregate planned and actual expenditure for the available projects, see Table 3.4. Because foreign exchange rates sometimes change mid-year, these need to be taken into account. Unfortunately, the impact is hard to assess because the projects for which information is available only represent a sub-set of the total program, and the impact of foreign exchange is only available over the entire program. But because foreign exchange has been relatively small (apart from in 2009-10), a reasonable comparison is possible.

Figure 3.4: Planned verse achieved investment in major capital equipment projects

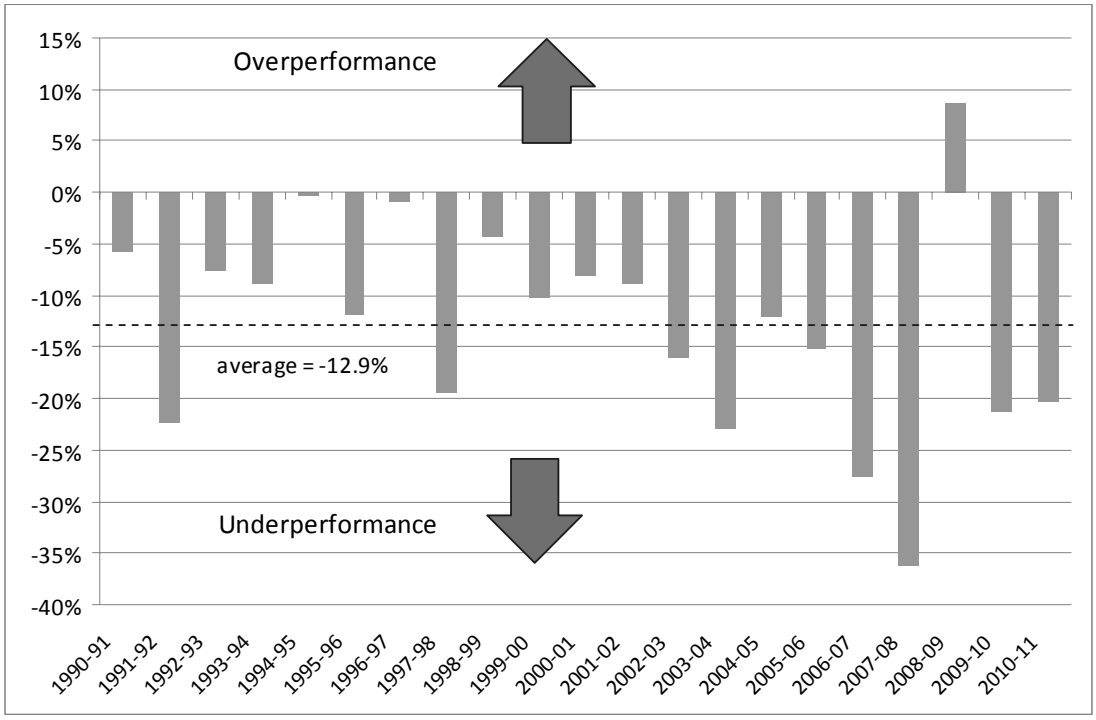
	Number of Projects	Budget	Revised	Actual	Actual - Budget	Percentage	Foreign Exchange
1990-91	15	1717.4		1619.1	-98	-5.7%	
1991-92	13	387.6		300.9	-87	-22.4%	
1992-93	13	1863.3		1722.1	-141	-7.6%	
1993-94*	22	1,881	1,753	1,714	-167	-8.9%	
1994-95*	18	1497.3	1527.1	1491.3	-6	-0.4%	
1995-96*	12	1515.8	1443.3	1336.6	-179	-11.8%	
1996-97	10	1678.7	1645.9	1663	-16	-0.9%	

1997-98	7	1,292	0	1,042	-250	-19.4%	16
1998-99	21	1,836	1,861	1,758	-78	-4.2%	30
1999-00	18	1,937	1,884	1,739	-198	-10.2%	42**
2000-01	20	1,927	2,062	1,770	-157	-8.1%	
2001-02	24	2,181	2,028	1,988	-193	-8.8%	72
2002-03	31	2,693	2,622	2,261	-432	-16.0%	32
2003-04	30	2,654	1,993	2,047	-607	-22.9%	-215
2004-05	30	2,722	2,468	2,394	-328	-12.0%	80
2005-06	30	2,853	2,681	2,423	-430	-15.1%	43
2006-07	30	3,978	3,209	2,879	-1,099	-27.6%	29
2007-08	30	2,847	2,053	1,817	-1,030	-36.2%	-190
2008-09	30	3,474	3,360	3,777	303	8.7%	397
2009-10	30	5,820	5,111	4,580	-1,240	-21.3%	-652
2010-11	30	5,407	4,305		-1,102	-20.4%	-62

*Only significant changes were reported so that percentage figure is less reliable than for other years.
**Foreign exchange applies to entire budget not just the investment program.
Source: Defence Budget Papers and Annual Reports. Only the revised figure is available for 2010-11

The results are graphed in Figure 3.10. Note that the results from 1993-94 to 1995-96 only take into account 'significant' changes. As a result, the figures for these years probably slightly underestimate the extent of underperformance. More importantly, the latest figure for 2010-11 is probably overly optimistic given that the final result was a net hand back of $815 million after the purchase of an extra C-17 ($252 million) and HMS *Largs Bay* ($104). In any case, it is hard to see any improving trend in performance post 2004.

Figure 3.10: Per cent under- and over-spent on total capital equipment projects

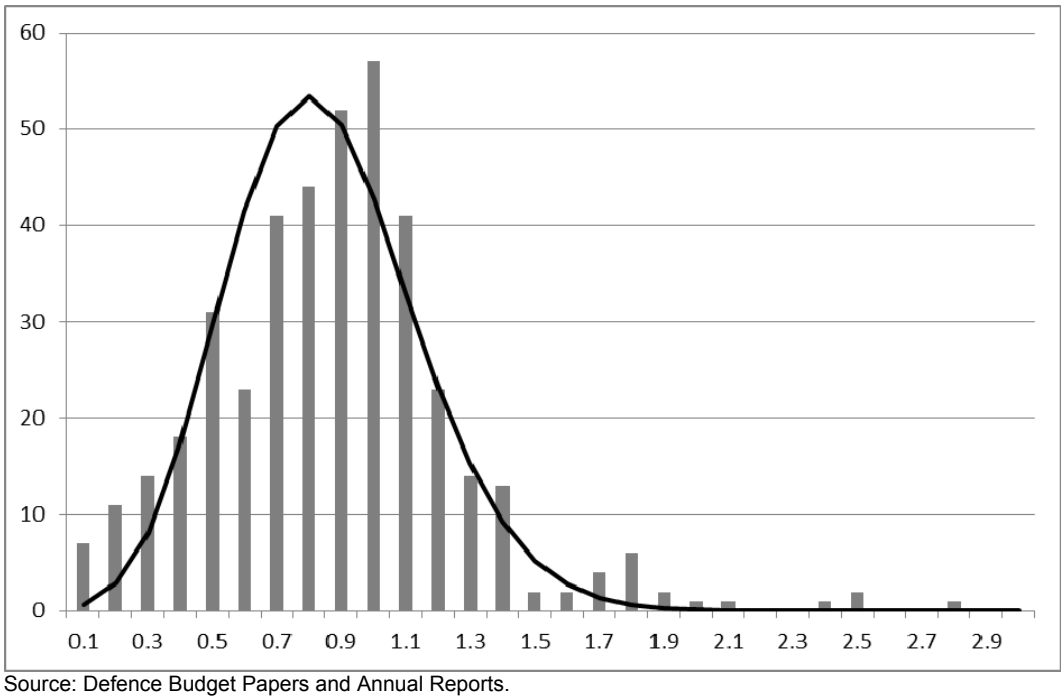


Source: Defence Budget Papers and Annual Reports. Only the revised figure is available for 2010-11

The analysis of aggregate figures risks the result being skewed by one or more large rogue projects. To get around this, the results for individual projects can be analysed on a normalised basis. Figure 3.11 shows the result for the 411 projects-years in our

two-decade sample, where the horizontal axis records the proportion of planned spending achieved. For example, 0.8 corresponds to 80% of planned spending achieved and 1.2 to 120%.

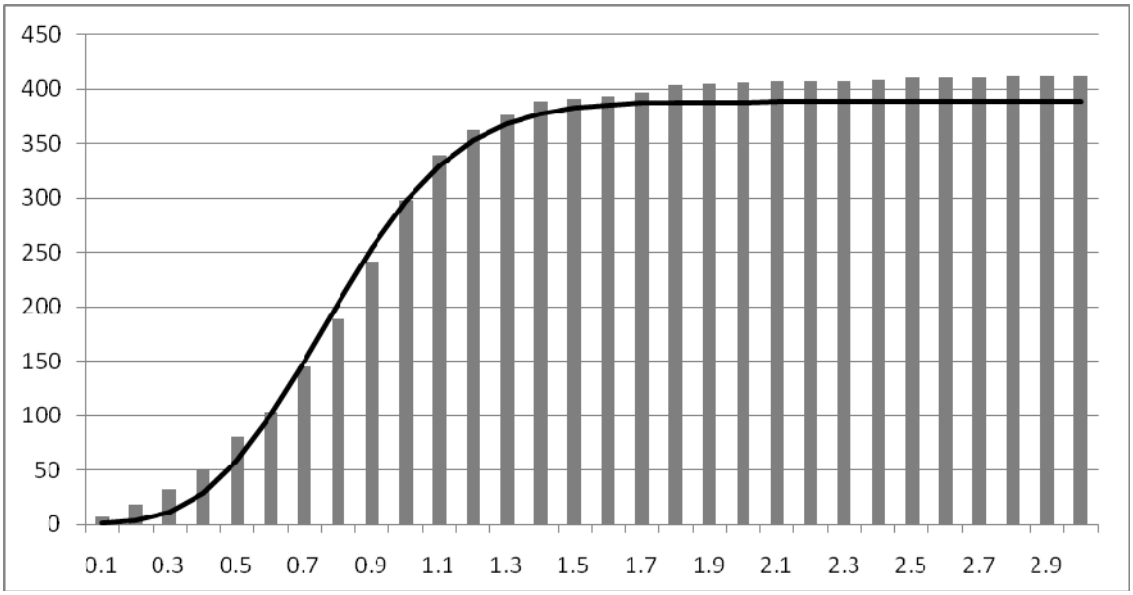
Figure 3.11: Distribution of actual/planned expenditure 1990 - 2010



Source: Defence Budget Papers and Annual Reports.

To a good approximation, the distribution of project events in Figure 3.11 approximates a Poisson distribution with an average of 85%. Roughly speaking, this corresponds to an historical rate of slippage of 15% in individual projects.
The correspondence is even more apparent in Figure 3.12 where the data is plotted as a cumulative distribution. Average slippage across the portfolio of projects over time is plotted in Figure 3.13.

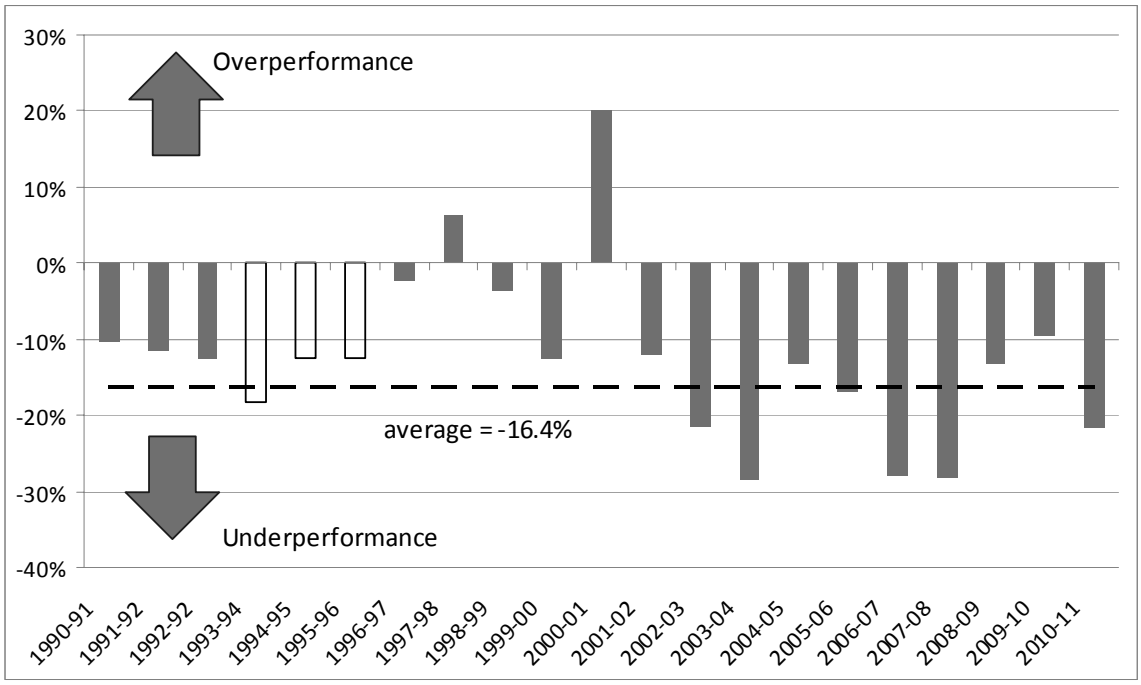
Figure 3.12: Cumulative distribution of actual/planned expenditure 1990 - 2010



Source: Defence Budget Papers and Annual Reports.

Given the consistent tendency of projects to underperform by around 15%, the current and longstanding application of overprogramming is entirely appropriate.

Figure 3.13: Per cent under- and over-spent on total capital equipment projects



Source: Defence Budget Papers and Annual Reports.

Although the patterns in Figure 3.10 and 3.13 differ (as you would expect), it is impossible to identify a trend for better or worse in either. Whatever improvement has been delivered by the reforms to defence procurement is obscured by the coarseness of using expenditure as a metric for progress and the slow introduction of projects that have been through the new process.

Of course, an analysis using actual data on project slippage (something that is not available in the public domain) might be able to discern a difference. In fact, when announcing the recent package of further reforms to defence procurement, the government said that major projects 'which have been through the two-pass system demonstrate a 20 per cent to 25 per cent improvement to their schedule when compared to those that did not'.

Accepting this at face value, it means that the benefits of reform have been relatively modest when it comes to reducing schedule slippage. For example, it means that the average observed two years delay in large projects will only fall to eighteen months. What's more, given that many of the projects that have come through the new systems are still ongoing, there is still time for further slippage to occur.

Risk, reform and equipping the ADF

As we saw it the last section, delays in major projects remain a persistent problem. To some extent, this is managed through the prudent application of 'over-programming', which allows for inevitable 'slippage' in the overall major capital program. But there is a limit to how effective this can be given the volatility of projects, especially with large individual projects (like Air-to-Air Refueling and the Air Warfare Destroyer) accounting for a significant share of the overall program.

And while procurement reforms appear to be making a difference, as we've seen, the improvement to schedule is relatively modest. Moreover, this improvement almost certainly derives in part from a better *understanding* of schedule rather than a forestalling of delays. This distinction is important. A better understanding of schedule allows better programming of expenditure and helps avoid embarrassment, but it does not deliver capability any quicker to the defence force.

So what is to be done? After more than a decade of reform, the delivery of defence projects continues to frustrate governments and the defence force. Here are four suggestions:

Continue with the current reforms: There is no point throwing in the towel and abandoning the reforms that are underway. Many of the reforms—like the professionalisation of DMO—are long-term strategies that will only deliver rewards over time. In the same category are the development of better contracting, imposition of disciplined reporting, and improved project oversight through gateway reviews.

Improve capability development: The development of project proposal continues to be the responsibility of military officers on short-term appointments. While military input is critical to capability development, the function should be increasingly performed by a professional cadre. In addition, proposals should be subject to rigorous *independent* review within Defence to ensure (1) a sensible balance between risk and reward, and (2) alignment with strategic imperatives.

Buy more Military-Off-The-Shelf (MOTS) Equipment: The clear lesson from recent years is that MOTS equipment from existing production lines can provide the ADF with equipment quickly and at a known cost. As a principle, the development of the ADF should be based on buying MOTS equipment and maintaining strict configuration alignment with parent militaries. Buying equipment by methods other than off-the-shelf should be based on a business case that establishes that a bespoke solution is either unavoidable or provides better value for money.

Manage rather than avoid risk: Extensive experience with defence projects around the world (and also with similarly complex projects in other sectors) shows that there is intrinsic and inescapable risk with bespoke equipment solutions and the resulting developmental programs. So when a MOTS solution cannot be found, there will be risk. This is likely to be a more frequent occurrence than might be expected (or desired). To start with, the demand for interoperability with legacy systems already in the inventory and the timings of overseas programs mean that MOTS solutions cannot be found in every instance. Moreover, the persistent desire of successive governments to 'create jobs' (which actually amounts to the diversion of skilled labour from more productive activities more often than not), will dampen enthusiasm for overseas purchasing and lead to Australian construction of military platforms. And, moreover, even seemingly modest adaptations, such as fitting MOTS systems to MOTS platforms, can be problematic because the integrating of existing systems can result in risky engineering challenges. (The FFG upgrade has already demonstrated this effect, and the Air Warfare Destroyer project will likely do so in spades in the years ahead.)

So there will be risk to be managed in the future. This cannot be avoided. The challenge for the government is to apply due diligence and eschew easily foreseeable and avoidable risks, but not pursue the diminishing returns that comes from trying to

extinguish every skerrick of risk. Attempting the latter can be seductive because every additional piece of information provides greater confidence that things will go according to plan. But, as a classic CIA study in intelligence assessments revealed, there is a difference between confidence and accuracy (See Richard J. Heuer, Jr; *The Psychology of Intelligence*, Chapter 5). Past a certain (usually modest) point, additional information simply builds false confidence without adding any additional accuracy.

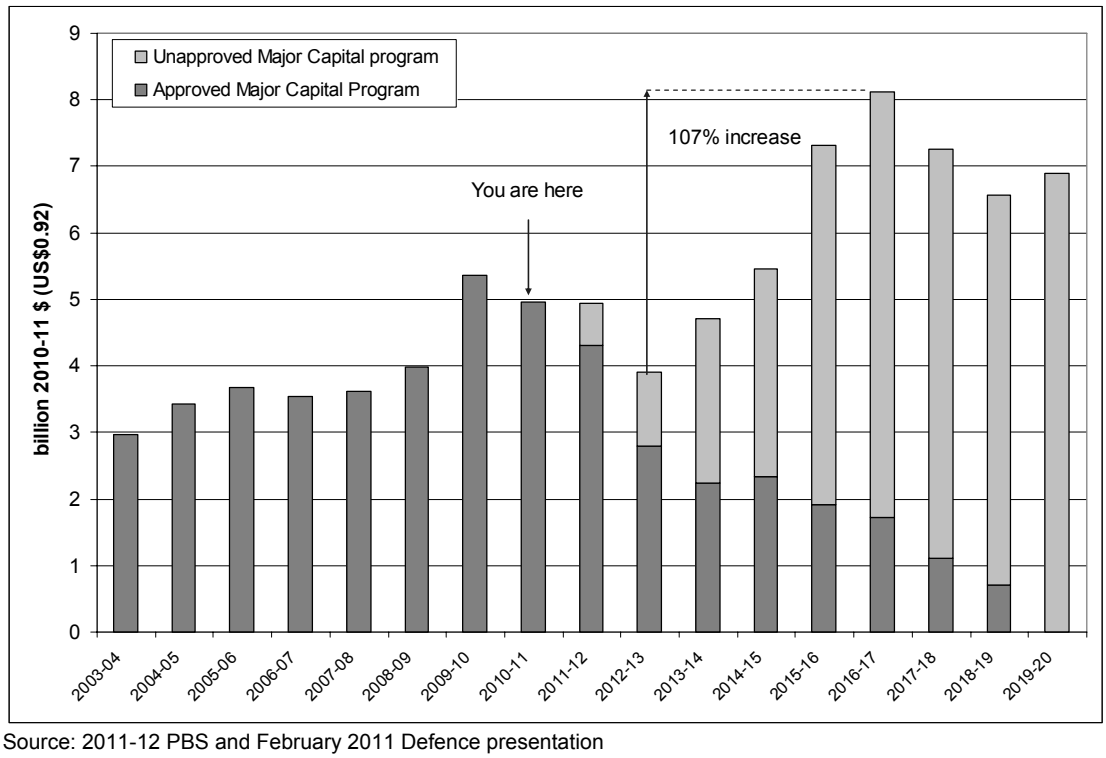
With delays mounting since the introduction of the two-pass process, the question must be asked whether we have crossed over into the realm of diminishing returns in a futile attempt to evade the inescapable risks in projects. This question is critical. The rational approach is to retire risk when it is cost-effectively to do so, and to identify and manage the residual risk when it is not.

The Feasibility of Plans for Force 2030

The recent deferral of projects has exacerbated the problem created back in 2009 when the first tranche of deferred investment created a veritable mountain of investment post 2012-13.

Although Defence no longer discloses its long-term investment plans, an official provided a snapshot of planned DMO spending as at February 2011. We've done our best to update that information to take account of the latest round of delays; the result is Figure 3.14 which should be taken as indicative. Given the limitations of industry already apparent, it goes without saying that the planned growth in investment will sorely test the capacity of defence industry to respond—especially given the competition for skilled labour in what's shaping up to be the largest resources boom in Australia's history.

Figure 3.14: Past and planned Major Capital Investment



Source: 2011-12 PBS and February 2011 Defence presentation

The Affordability of Force 2030

While Defence appears to have all the money it needs for the moment, the longer term picture is less clear. The notion that 2.2% real growth will be adequate past 2017-18 seems very optimistic. Previous ASPI analysis of the underlying cost of maintaining defence (see Thomson and Davies, *Strategic Choices: Defending Australia in the 21st Century,* 2008) estimated that to 'tread water' in terms of size and scope of capability while maintaining an inventory of modern equipment requires average annual growth above inflation of around 2.6%. This also accords with the long-term post-WW II trend in Australian defence funding (see Chapter 5 of this Brief).

Further corroboration can be found in the long-term trends in US defence spending and output (see Thomson, *Trends in US defence spending: implications for Australia*, 2010). Using historical data going back to the 1950s, it's possible to measure the real annual increase in the cost per unit of US military capability. Calculated key results include an increase in the cost of aircraft of 3.5% per year, personnel 2.6% and naval vessels 3.5%. Combining these results and accounting for central defence-wide costs gives an estimate of 3.1% as the minimum real annual growth required to maintain an advanced military force. Thus, it seems doubtful that the 2.2% funding promised post 2017-18 will be enough to maintain the ADF, let alone expand its maritime forces as planned.

Further pressure on the long-term plan will come from the move to nominal (i.e. fixed 2.5% indexation) rather than real defence funding increases that take account of actual changes in the buying power of the dollar. Every year that inflation rises above 2.5% shaves a slice of buying power from each and every subsequent year of the 20-year White Paper program.

Table 3.5: The impact of fixed indexation on the buying power

	CPI	CPI – 2.5%	Impact on funding to 2030 (2011-12 $)
2008-09	3.1%	- 0.6%	- $3.9 billion
2009-10	2.3%	+ 0.2%	+ $1.2 billion
2010-11	3.25%	- 0.75%	- $4.5 billion
2011-12	2.75%	- 0.25%	- $1.4 billion
Total			**- $8.6 billion**

In the long run it probably doesn't matter. There will be White Papers and budget reviews aplenty in the years ahead. But it does make the point that fixed indexation is as poor a policy as it is lazy.

Conclusion

Back in September, Defence advised the government that *Force 2030* remained on track. In one sense it's hard to argue against such an assertion, with eighteen years left to go there is no reason why recent setbacks can't be reversed. We could run the Apollo program twice over in the time available. But surely that's not the question. Instead, we should be asking whether Defence plans over the next several years towards *Force 2030* are credible. And on that count, the answer must be a resounding 'no'.

On past experience, neither the rapid approval of projects nor the precipitous ramp up of production is plausible—especially in a period punctuated by a federal election and a new Defence White Paper. The time for pretending is over. The plan set out in the 2009 White Paper is in need or urgent revision.

Rather than waste resources trying to initiate an unachievable volume of projects over the next several years, a more modest and realistic plan should be adopted so that effort can be focused on those areas of most immediate priority to the ADF and Australia's security. To achieve this, the government should initiate a capability audit with the goal of putting the development of the defence force on a realistic and sustainable basis.

CHAPTER 4 –STRATEGIC REFORM PROGRAM

This chapter updates the extended analysis of the Strategic Reform Program (SRP) presented in last year's Budget Brief. The discussion is short because only limited information has been released about the SRP over the past twelve months. Nonetheless, some important collateral data has become available which allows the SRP to be better understood, including the government's recent decision to extract an additional $3.9 billion from Defence over the forthcoming decade. Readers wanting more detail about the underlying SRP should consult last year's Budget Brief.

Background

As the end of the last decade approached, there emerged two (almost contradictory) propositions about Defence funding. First, that there was not enough money in projected Defence funding to afford all that was planned in terms of new equipment and attendant personnel and operating costs. Second, that Defence was not as efficient as it could be having grown fat and complacent after close to a decade of escalating funding. Faced with this situation, in early 2008 the government directed Defence to find $10 billion of savings over the next decade.

Then in May 2008, the government appointed George Pappas to audit the Defence budget. His report was delivered to the Minister in April 2009. Recommendations included a range of initiatives, including improvements to Defence management and efficiency.

The Budget Audit identified prospective savings of $1.3 billion to $1.8 billion a year based on 2007-08 spending, plus one-off savings of between $218 million and $398 million. On an out-turned basis (taking anticipated inflation into account), the prospective recurrent savings over the decade commencing 2009-10 were between $15 billion and $20.7 billion.

To the work of the Budget Audit were added (1) the initial work done by Defence to save $10 billion, (2) the results of the 2008 Defence Procurement and Sustainment Review and (3) the results of a series of internal 'companion reviews' conducted in parallel to the 2009 Defence White Paper. The result was the SRP; a package of reforms and efficiency initiatives to improve Defence's performance and deliver $20.6 billion of savings over the next decade.

There are three key elements to the SRP: improved accountability, improved planning and enhanced productivity. We examined planned reforms to accountability and planning in detail last year and there is no point in recounting them again. It suffices to say that proposed initiatives are largely sensible and worthwhile (albeit conservative in some cases). This leaves productivity and the delivery of savings to discuss—and this will be our focus in what follows. While this yields an unashamedly incomplete picture of the SRP, it is appropriate for a Budget Brief. Readers interested in the broader aspects of accountability, planning and cultural change should consult the 2009-10 Defence Annual Report and the two SRP booklets published by Defence.

The SRP as it stood prior to the budget:

To properly understand what's happened to the SRP in this budget, we examine how things looked in April 2011.

Where do the savings come from?

Table 4.1 summarises the results of our analysis of SRP savings from twelve months ago. Then, as now, around a quarter of the SRP savings were yet to be publicly explained, including $1.3 billion in information and communications technology (ICT) savings and $1.2 billion in shared services. We've only counted a saving as explained if a moderately complete explanation had been published. Note that in some areas where savings have been explained (such as Reserves and workforce) it is difficult to credit the amounts claimed on the basis of the actions to be taken; see last year's Budget Brief for a fuller examination

Table 4.1: What we know and what we don't know about SRP savings (as at April 2011)

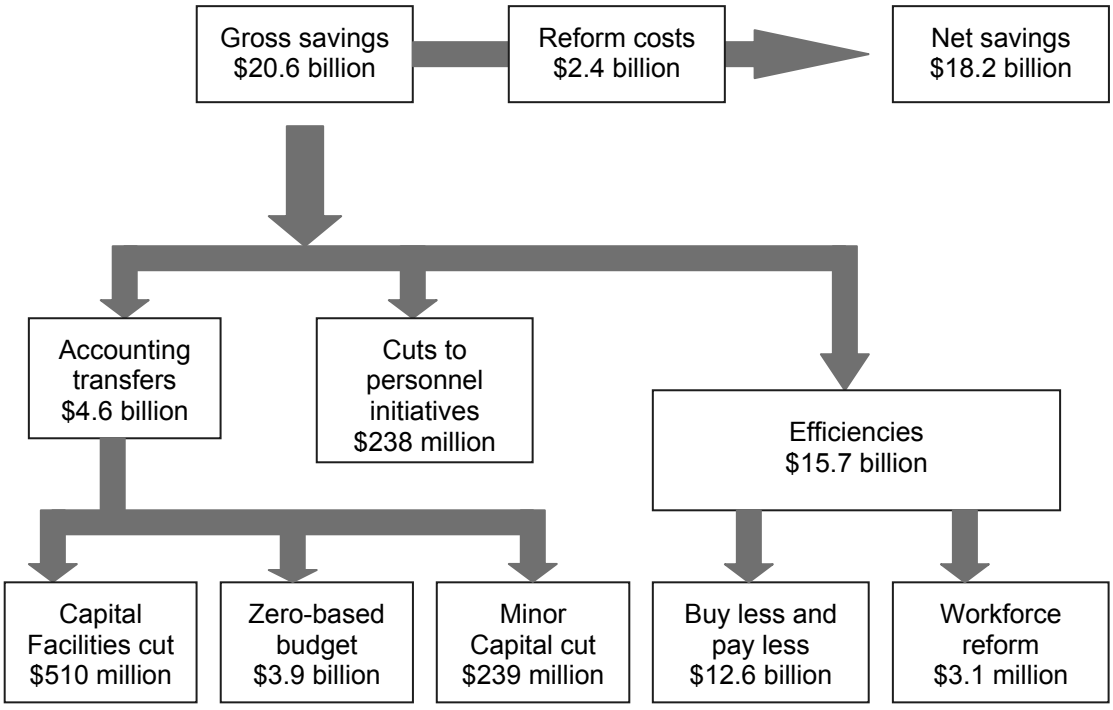
	Planned Savings	Explained Savings	Unexplained Savings	Comment
SRP savings streams				
ICT	-1,948	-650	-1,298	Impossible to verify from publicly available information
Inventory	-700	-700	0	Reduced inventory purchases are apparent in budget papers
Smart Maintenance	-4,827	-4,286	-541	Trends in sustainment budget indicative of onset of savings
Logistics	-350	-331	-19	Impossible to verify from publicly available information
Non-Equipment Procurement	-3,767	-3,172	-595	Impossible to verify from publicly available information
Reserves	-359	-179	-162	It is difficult to see how these measures will deliver the savings
Shared Services	-1,864	-706	-1,158	Impossible to verify from publicly available information
Workforce Reforms (civilianisation of ADF & PSP)	-925	-781	-144	The level of savings claimed appears high
subtotal	**-14,740**	**-10,805**	**-3,917**	
Other savings				
Zero-Based Budget	-3,922	-3,922		Not a saving or efficiency
Cuts to Minor Capital Program	-238	-238		Not a saving or efficiency
Cuts to Facilities Program	-510	-510		Not a saving or efficiency
Administrative Savings	-70	-70		Savings without personnel cuts?
Productivity Savings	-357	-357		Probably understates value of savings
Reduced NPOC	-586	-586		Will mainly result in additional savings from sustainment
Cuts to Personnel Initiatives	-238	-238		
subtotal	**-5,920**	**-5,920**	**-3,917**	
TOTAL	**-20,640**	**-16,725**	**-3,917**	

Source: ASPI Budget Brief 2009-10.

The key savings are captured schematically in Figure 4.1. The total of $3.1 billion for workforce reform includes reform to the Reserves plus savings in shared services which have not been disclosed in detail. As such, it represents an upper limit on savings from workforce reform.

Setting aside the accounting transfers and cuts to personnel initiatives, it's noteworthy that personnel reductions only made up at most 20% of the $15.7 billion of actual efficiency savings. This means that fully 80% of the savings was to come from cuts to the price and quantity of goods and services that Defence purchases externally. As a defence industry CEO observed at an industry conference in early 2010, personnel savings typically make up a much larger share of commercial efficiency programs than those planned under the SRP. In fact, his comment was made in the context of the original (May 2009) SRP plan, which had a larger impact on the Defence workforce than the April 2011 plan does. That's because between May 2009 and May 2010 the scale of personnel reductions was reduced substantially. As best we can tell, outright efficiency cuts fell from around 3,800 to 2,000, contractor conversions fell from around 1,000 to 700, and civilianisation of military positions fell from 1,100 to 700 (although this last figure might increase). Yet, somehow, the exact quanta of overall savings conveniently remained the same.

Figure 4.1: Planned SRP savings (as at April 2011)



Moreover, the retreat on personnel savings came on top of substantial additional personnel being added. Relative to the number of personnel in 2008-09, the gross additional number of personnel planned for Defence over the next decade was 5,174 military personnel and 2,685 civilians as at April 2011. Once savings were subtracted, the final result would have been 58,879 military and 22,719 civilians, representing net increases of 3,798 and 1,494 respectively. Even if we subtract from this the extra 658 positions that we estimate would have been needed to achieve planned savings, that's still an increase of more than 4,500 positions.

Given the several additional capabilities planned to enter service in the near future, especially the substantial expansion of the Army underway, it is to be expected that the number of military personnel will expand significantly in the years ahead. No such

explanation comes readily to hand for the very large number of baseline civilians then planned *above that required* for civilianisation and contractor conversion (2,685).

This brings us to the critical nub of how savings are calculated. It is perfectly possible for Defence to declare savings relative to projections of its future expenditure while nonetheless spending more each year. Indeed, given the expansion underway to deliver the White Paper, this will be the case—savings are relative to a counterfactual estimate of what costs would have been absent reform. This is explicitly the case with personnel numbers—savings are being claimed but military and civilian numbers are going to increase anyway. The critical question is whether the 'business as usual' baseline is justified or not; it is only by comparison with an established trend taking account of new initiatives (including those in the 2009 White Paper) that the validity of savings can be established. But, as Table 4.1 makes clear, this is not possible to do using publicly available information. And while Defence is adamant that their baseline for savings is robust, they are not willing to make the details available for public scrutiny. As we'll see, the more we learn the less plausible the scale of claimed savings becomes.

Finally, it's important to note that the rhetorical claim that cost reductions 'will be made available for reinvestment in *Force 2030'*, is misleading. All of the prospective savings have been explicitly built into the budget for the decade ahead. Any shortfall will result in cost pressures rather than an absence of funds for reinvestment.

Results so far

When discussing the potential verification of the SRP last year, we concluded that 'given recent experience, we are unlikely to be given anything more than unverifiable aggregate headline figures.' The 2009-10 Defence annual report confirmed our low expectation. Here in full is the table of SRP savings from the 2009-10 annual report:

Table 4.2: Reported gross SRP savings for 2009-10

Reform stream	Cost reduction target	Cost reductions achieved
Information and Communications Technology	$49 m	$94 m
Smart Sustainment[1]	$263 m	$461 m
Non-equipment Procurement	$172 m	$343 m
Workforce and Shared Services	$58 m	- $131 m
Other Savings (including logistics)	$255 m	$255 m
Total	**$797 m**	**$1,022 m**

[1]Total Smart Sustainment cost reductions include $197 m of one-off expense reductions.

The annual report notes an over-achievement of total cost reductions of approximately $225 million. The reported performance for 2009-10 and progress in 2010-11 is examined below in light of additional information.

Information and Communications Technology (ICT) ($1.9 billion savings over decade)

In 2009-10, ICT savings of $49 million were expected but according to the annual report, savings of $94 million were achieved in 2009-10—almost twice that expected. Taking into account the $100 million in ICT reform costs for 2009-10, we should expect to see a $6 million increase in ICT spending in 2009-10. However, according

to the notes to the financial statements in the 2009-10 annual report, $65 million *more* was spent in real terms on ICT goods and services in 2009-10 than in 2008-09. As an alternative measure, in 2009-10, the Chief Information Officer spent $82 million *more* in real terms on suppliers expenses than in 2008-09. By either measure, the claimed ICT savings are based on a high counterfactual baseline. See Table 4.3.

Table 4.3: Reported net ICT savings for 2009-10 and comparators

SRP costs ($100 m) – SRP gross savings ($94 million)	+ $6 m
Year-on-year real change to spending on ICT goods and services	+ $65 m
Year-on-year real change to CIO spending on suppliers expenses	+ $82 m
Gap	**$59 m to $76 m**

Source: 2009-10 DAR and SRP Booklets

Smart Sustainment ($5.5 billion gross savings over the decade)

In 2009-10 smart sustainment planned to deliver $263 million gross savings. But according to the annual report, $461 million of savings were achieved of which $197 million represents a one-off saving including from a reduction in world fuel prices. However, the difference between planned ($476 million) and actual ($318 million) expenditure on fuel leaves $39 million unexplained.

Reported cost reductions are compared with the year-on-year reduction in DMO sustainment expenses in Table 4.4. Note that the gap between claimed/planned savings and actual/planned costs grows rapidly over the next two years.

Table 4.4: Reported Smart Sustainment savings 2009-10 and comparators

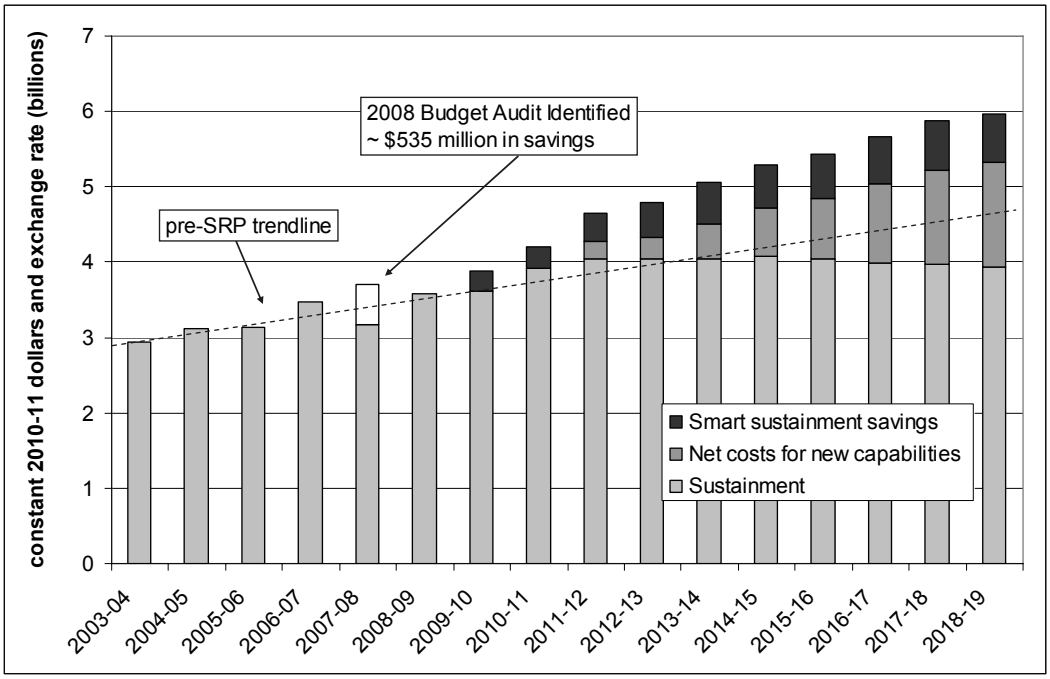
	2009-10	2010-11	2011-12
SRP costs	$38 m	$46 m	$50 m
SRP gross savings	- $461 m	-$281 m	-$356 m
Net SRP savings (costs + gross savings)	- $423 m	- $235 m	- $306 m
Year-on-year real change to DMO sustainment expenses	- $268 m	+$140 m	+$684 m
Gap	**$155 m**	**$375 m**	**$990 m**

Source: SRP booklets, PBS, DAR and February 2011 presentation by Defence official

Once again, it appears as though the savings are relative to a high counterfactual baseline—though given the introduction of new capability, at least the first two years are not unreasonable. Further insight can be gained from the chart of past and planned DMO sustainment spending disclosed in a public presentation by a Defence official in early 2011. The data, which is reproduced in Figure 4.2, has the merit of being in constant 2010-11 dollars and exchange rate (US0.92). To show the counterfactual baseline against which savings are claimed, planned cost reductions have been added for each year. One-off savings in 2009-10 have been ignored.

The 2008 Defence Budget Audit estimated that savings of between $354 million and $615 million were achievable from the 2007-08 equipment support budget. To show how high the counterfactual baseline is for sustainment, the average of these two figures (in 2010-11 dollars) has been overlaid on the sustainment budget for that year. At least some of the difference is likely to be due to the extra cost of sustaining capabilities acquired in the period 2008-09 to 2010-11. We lack the data to say how much.

Table 4.2: DMO sustainment and planned SRP savings



ASPI analysis of Defence data disclosed in a Defence presentation, February 2010-11.

Non-equipment procurement ($3.8 billion gross savings over the decade)

At present, Defence spends around $2.8 billion a year on 20 categories of support services, including training, travel, catering and business. From this, total savings of $3.8 billion are planned over the decade. Savings over the decade include hospitality and catering ($241 million), office furniture and supplies ($68 million), procured training ($607 million), common support services ($418 million), facilities maintenance ($505 million), professional services ($709 million), travel ($624 million) and utilities ($64 million). A further $595 million in savings will come from advertising, Health Services, Removals and Research and Development. In 2009-10 gross savings of $172 million were planned. However, according to the 2009-10 annual report, $343 million of gross savings were achieved. Table 4.5 compares the reported savings with relevant comparators.

Table 4.5: Reported net non-equipment procurement savings 2009-10 and comparators

SRP costs ($55 m) - SRP gross savings ($343m)	- $288 m
Year-on-year real change to Estate upkeep ($541m - $468m)	+ $73 m
Year-on-year real change to Professional and technical advice ($542m - $468m)	+ $47 m
Year-on-year real change to Research and development ($157m - $157m)	0
Year-on-year real change to Utilities ($143m - $142m)	- $1 m
Year-on-year real change to Training ($293m - 296 m)	- $ 4 m
Year-on-year real change to Travel ($199m - $212m)	- $12 m
Year-on-year real change to garrison support ($568m - $581m)	- $13 m
Year-on-year real change to freight, storage & removal ($391m - $409m)	- $18 m
Total year-on-year real change to identified items ($2,834m - $2,761m)	**+ $73 m**
Gap	**$361 m**

Source: 2009-10 DAR p. 218

Again, given that the overall actual costs in the relevant categories increased year-on-year, the scale of saving reported implies a high counterfactual baseline.

Workforce and shared services
($2.8 billion savings over 10 years)

As explained last year, cost reductions in the 'workforce and shared services' category are complicated and only partially disclosed. As best we can tell, in 2009-10 $58 million of gross savings were planned, along with $20 million in reform costs. The 2009-10 annual report says that rather than savings, additional costs of $131 million were incurred due to increased ADF retention. Actually, the situation is a little more complicated.

At the time of the 2009-10 Budget, there were 1,009 unassigned positions labeled 'White Paper and Strategic Reform Program' which could have been either civilian, contractor or military positions. An SRP booklet released in May 2009 (soon after the Budget) gave as 'indicative' numbers 56,742 military and 22,310 'civilians plus contractors'. It was not until November 2009 that a firm set of figures appeared in the 2009-10 PAES. With no earlier complete set of figures to work from, we have no alternative but to use these as the 2009-10 baselines. These appear in Table 4.6 along with the corresponding expenses and final results for 2009-10. Figures for contractor costs are based on them costing 25% more than APS employees. This probably overstates their cost a little given that Defence says that they cost *between* 15% and 30% more. Curiously, the additional cost only comes to $83 million, which is almost $50 million less than Defence's reported figure. Perhaps they are being too hard on themselves.

Table 4.6: Workforce costs 2009-10; planned and actual

	2009-10 PAES	2009-10 Actual	Difference	Per capita	Cost
Military personnel	56,325	57,697	1,372	$133,445	+ $183 m
Civilian personnel	20,703	20,058	- 645	$93,793	- $60 m
Contractors	1,157	820	-337	$117,201	- $40 m
				Total	+ $83 m

Source: 2009-10 DAR and PAES

The trend towards over-achievement in military personnel numbers and under-achievement in civilian personnel numbers continued into 2010-11. As a result, in May 2011 the government announced that civilian personnel numbers would be reduced by 1,000 below planned levels. Defence advises that the reductions are 'permanent'.

So what are we to make of what has happened? There are two points to make. First, military personnel numbers are more of an emergent property rather than a managed outcome in Defence. Second, the number of civilians and contractors that Defence estimated that they needed was too high. In making this assessment, it is relevant that the bulk of the additional personnel are enlisted members of the army and air force—with limited scope to undertake the jobs envisaged for civilians.

The fact that Defence managed to continue to deliver their outcomes for two years with substantially fewer non-uniformed personnel than first estimated, shows that at least some of the 'extra' positions granted as part of the White Paper were unnecessary. The exception to this would be shortfall in DMO which may be explained by delays in project commencement.

Other savings and logistics ($6.3 billion gross savings over the decade)
Most of the 'other savings' in the SRP are remnants of the $10 billion decade-long savings program announced back in 2008; specific measures are listed in Table 4.7 along with logistics. The final two items—reductions to net personnel and operating costs (NPOC) and personnel initiatives—only appeared in April 2010. Not much new information is available to further illuminate what's happening in these areas. But a couple of points are worth making about the zero-based budget and the cuts to the minor capital and capital facilities programs.

Table 4.7: Other savings and logistics

Initiative	Gross saving
Logistics	-350
Zero-Based Budget	-3,921
Cuts to Minor Capital Program	-238
Cuts to Capital Facilities Program	-510
Administrative Savings	-70
Productivity Savings	-357
Reduced Net Personnel and Operating Costs	-586
Cuts to Personnel Initiatives	-238
Total	**-6,270**

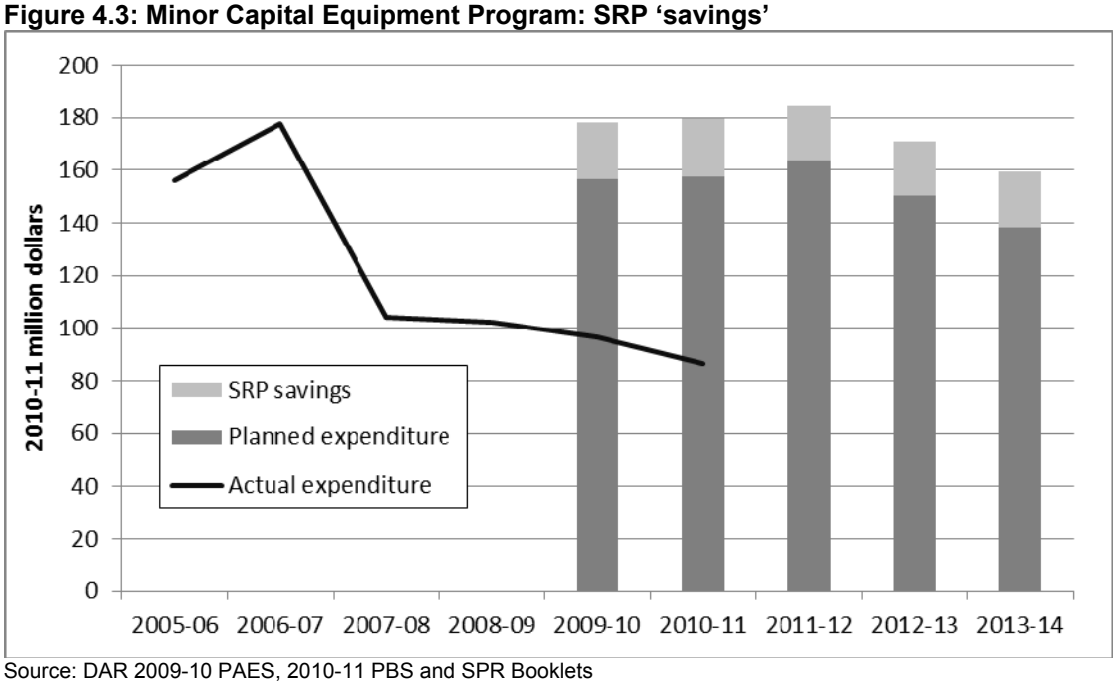
Zero-based budget
The so-called 'zero-based budget' represents nothing more than the reallocation of funds held centrally that were programmed in earlier years for price indexation and 3% real budget growth. Using funds that were appropriated to meet rising costs for the purpose of meeting rising costs is neither a saving nor an efficiency improvement.

Cuts to Capital Facilities and Minor Capital
Further savings come from cuts to the minor capital and capital facilities programs. The first point to stress in both these cases is that scaling back on planned investment does not generate efficiency. Rather, it causes a simultaneous reduction in both inputs and outputs. At best, it represents a reprioritisation that allows money to be shifted from one use to another. Such adjustments are common from year to year within the budget and no one pretends that they constitute a savings of any sort. In the case of minor capital equipment, the 'savings' are difficult to discern on the basis of historical and projected spending, see Figure 4.3. As shown, the savings are relative to a substantially elevated profile which is 70% above that recorded in the previous two years. Even more surreal, actual expenditure has come nowhere near the levels envisaged.

In the case of the facilities program the situation is particularly egregious. Over the first four years of the SRP, $150 million in previously planned capital facilities investment has been cancelled and designated as a 'savings'. Yet, at the same time,

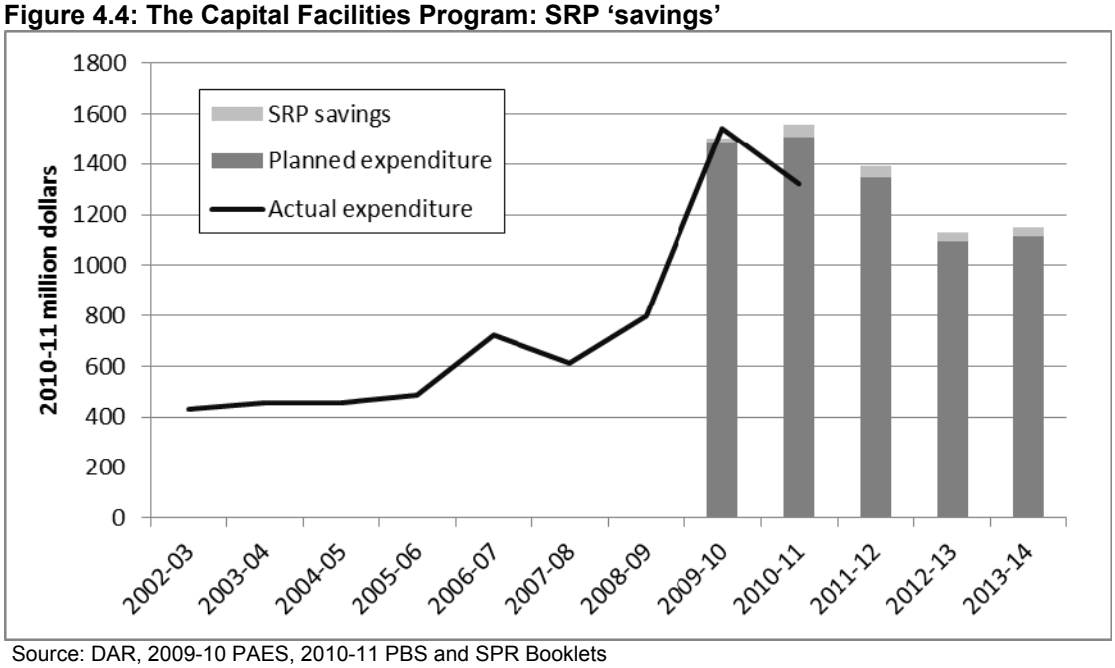
the SRP touts a $190 million capital facilities reinvestment program to 'help address the deterioration in Defence facilities' over the same period. What's more, capital facilities investment has not been reduced relative to an existing trend. As Figure 4.4 shows, the reductions are once again relative to a substantially elevated baseline of spending. And to make things even sillier, actual spending in 2009-10 exceed the planned level thereby erasing any savings, while in 2010-11 the revised estimate is for a $70 million underspend. The 2011-12 Budget deferred around $586 million of capital facilities expenditure to beyond the forward estimates. Fortunately, this was not claimed as a saving.

Figure 4.3: Minor Capital Equipment Program: SRP 'savings'



Source: DAR 2009-10 PAES, 2010-11 PBS and SPR Booklets

Figure 4.4: The Capital Facilities Program: SRP 'savings'



Source: DAR, 2009-10 PAES, 2010-11 PBS and SPR Booklets

The 2011-12 Budget and the SRP

Reading the 2011-12 PBS and accompanying press releases, one is invited to conclude that the SRP savings program is going from strength to strength. The original $20.6 billion savings program has been boosted by $3.9 billion (including the $500 million in C-130J funding that was returned to the Treasury). In terms of the $3.3 billion in non-investment savings, here's what we've been told:

- Increased efficiencies amounting to $2.9 billion over the decade will be delivered by 'additional efficiencies in corporate and support functions in the defence portfolio, including through greater reductions in duplication and increased use of shared services'. This includes the reduction by 1,000 in the civilian workforce.
- A further $406 million to be saved across the decade through a 'temporary increase in the rate' of the broader public service efficiency dividend.

Further explanation was provided by way a three-part, five-page 'Defence Budget Brief' distributed by Defence officials on Budget night. It explains that the $2.9 billion increased efficiencies budget measure entails:

- A saving of $368 million over four years from reducing the number of civilians, including through reforms to Shared Services.
- A reduction in supplier expenses in light of the 2010-11 underspend and success with SRP savings.
- A reduction of $250 million in Net Personnel and Operating Costs in light of the 2010-11 underspend and slippage in various capital programs.
- A reduction in the cost of SRP implementation by $60 million across the decade.

Although delays in delivering new capability explain some of the reduced demand for people and money, it's increasingly clear that the 2009 funding agreement granted Defence considerably more money and personnel than they needed. All signs are that the government has now realised this and taken the excess away.

The hand back of funds this year and the imposition of $3.9 billion in additional savings has important implications for the scale of savings claimed under the SRP. Put simply: if there are surplus resources available after savings are delivered, it follows that the savings were relative to an unrealistically high baseline. Indeed, it appears as though the baseline was at least $4.3 billion too high. That's not counting the accumulation of roughly $437 million of unspent money in the DMO Special Account over the past two years.

Consistent with this, the foregoing analysis of SRP savings in 2009-10 shows that some of claims (data exists only to check a few) are based on surprisingly high 'business as usual' baselines. And, as we saw last year, other savings (such as in the Reserves) are simply implausible. Only two year's into the program and the credibility of the claimed $20.6 billion in savings is looking shakier the more we learn.

It's a pity. There is a lot of accumulating evidence that the SRP is delivering real and substantial savings through innovation and cost-consciousness across many parts of

the organisation. For example, the recent renegotiation of the contract for maintaining the Jindalee Operational Radar Network (JORN) delivered $100 million in savings over the decade.

Unfortunately, the credibility of this good work is being undermined by clinging to the headline-grabbing claim of delivering $20.6 billion (now $24.5 billion) worth of savings in the face of mounting evidence to the contrary. More seriously, it continues the fallacy that Defence has an accurate understanding of its budget a decade hence. Whereas it's now clear that Defence struggles to understand and manage its finances from one year to the next.

CHAPTER 5 – INTERNATIONAL DEFENCE ECONOMICS

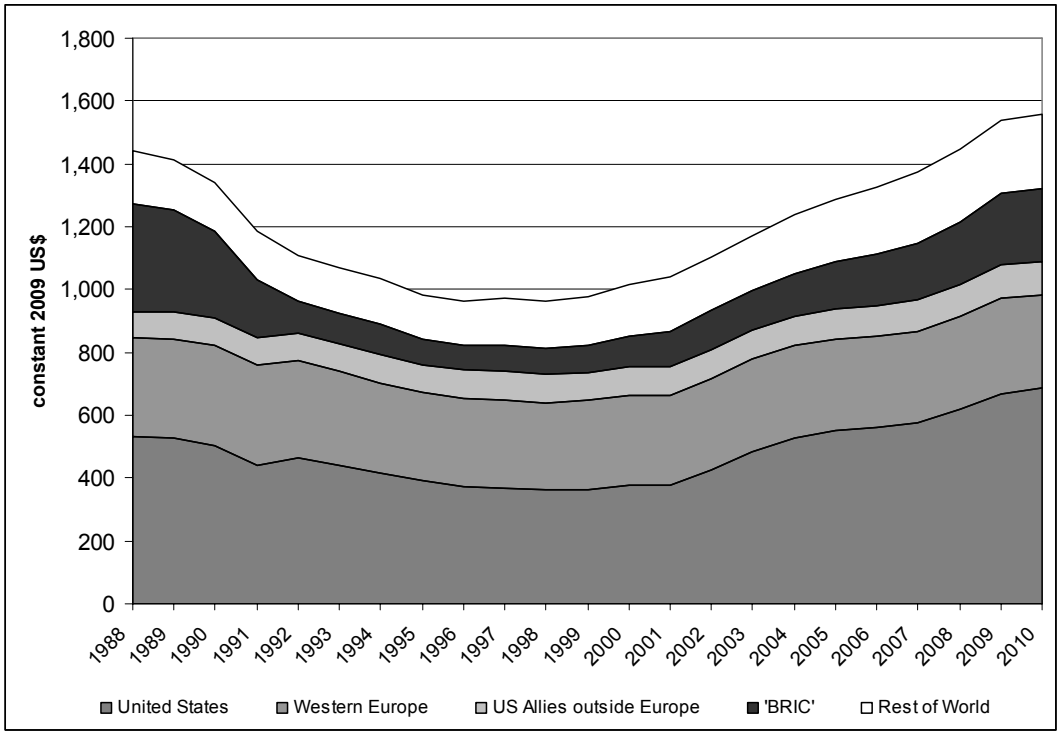
This chapter is divided into three parts. The first examines key international defence spending trends. The second explores Australian defence spending in an international and historical context, and the third explores the continuing impact of the Global Financial Crisis (GFC) on counties' abilities to spend on defence.

Throughout this chapter, defence spending statistics from a variety of source are used. Given the unresolvable questions of definition and reliability, one source is usually as good as another. With this in mind, the most convenient source of data has been chosen to allow for a consistent comparison in each case.

International trends

Global defence spending from just prior to the end of the Cold War to 2010 is graphed in Figure 5.1, where 'BRIC' refers to the (re-)emerging powers of Brazil, Russia, India and China, and the US allies outside of Europe are Australia, Canada, Japan, Korea, New Zealand and Taiwan.

Figure 5.1: Global defence spending 1988 to 2010



Source: Analysis of data from SIPRI Military Expenditure Database 2011, www.sipri.org
Russian spending interpolated for 1991. Chinese spending extrapolated for 1988.

The United States dominates global defence spending, and the recent US-led invasions of Afghanistan and Iraq gave rise to a decade-long increase in the global figure. In 2010 the United States accounted for 44% of the global defence spending, and once its friends and allies are taken into account the 'West' as a whole accounts for just on 70%. However, in 2010 US and global defence spending increased more slowly than at any time since the attacks of 9/11—the combined result of fewer US forces in Iraq and the broader fiscal pressures caused by the Global Financial Crisis.

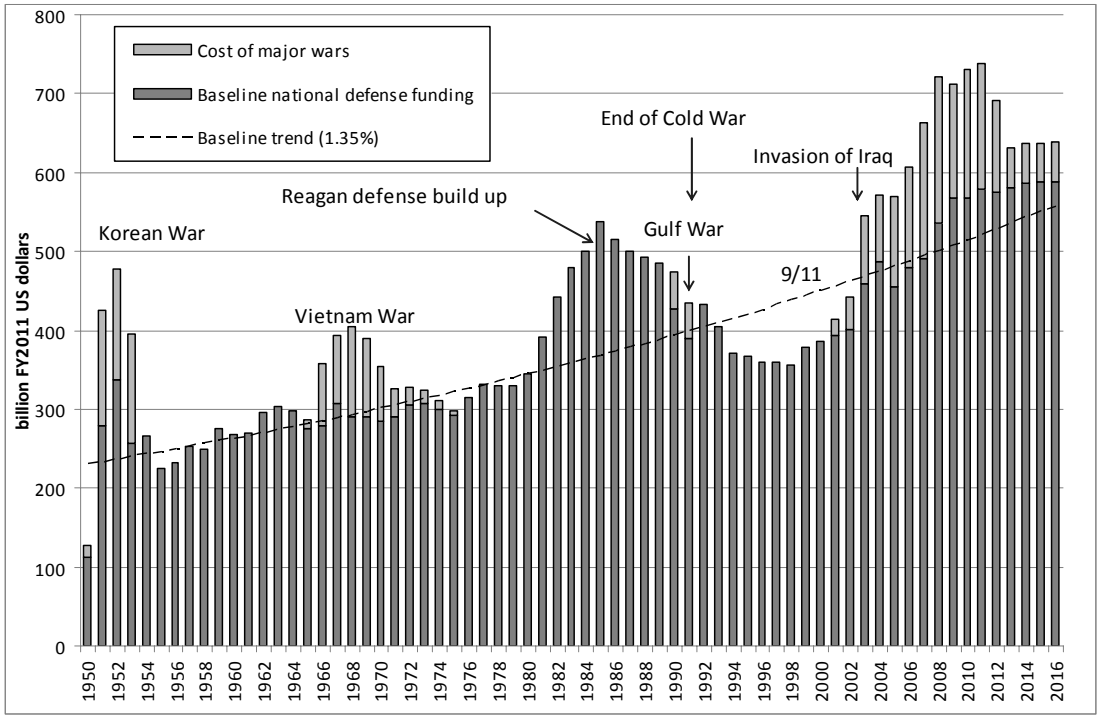
The United States

After a decade of strong growth, the US defence budget has moderated over the past three years. It's likely that spending will fall over the medium term due to mounting fiscal pressures and the withdrawal of troops from Iraq and Afghanistan. In terms of the baseline budget (exclusive of funding for deployments), the FY2012 budget projects real annual growth of only 0.6% out to 2016.

However, negotiations between the Congress and the White House on deficit reduction are ongoing and future funding is uncertain. Reports in early 2011 suggested that an extra $100 billion of reductions over four years are likely. If this occurs, the baseline defence budget would have to fall, thereby continuing the cyclic pattern of US defence spending post WWII. Absent a new war or serious peer competitor, US defence spending is likely to be driven further down as part of a broader fiscal consolidation—especially with defence spending now accounting for no less than 4.7% of GDP.

Even if US baseline defence spending returns to its long-term historical trend of 1.35% annual real growth, the size of US armed forces will continue to decline. Over the past six decades, the annual cost of maintaining a US navy vessel in service has risen by an average of 3.5% above inflation. Over the same period, the costs of aircraft and soldiers have risen in real terms by 3.5% and 3.1% per annum respectively. As a result, the strength of the army has more than halved and the numbers of aircraft and ships have been reduced four-fold since the 1950s (see ASPI Policy Analysis #56, 2010). Consequently, although the United States remains the most powerful military force on earth, its ability to mount large-scale operations is slowly eroding along with its capacity for concurrent operations.

Figure 5.2: US defence spending 1950 to 2016

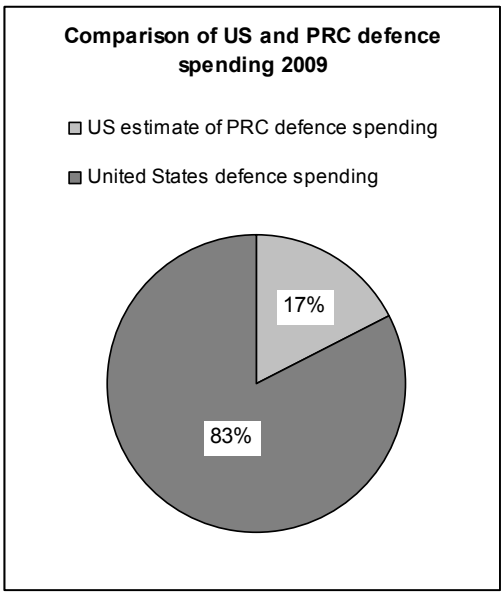


Source: CSBA 'Analysis of the FY 2011 Defense Budget' and official FY2012 US budget papers. Note that operational supplementation post 2012 is likely to increase.

The Peoples' Republic of China

China has enjoyed rapid economic growth since the mid-1990s. Over the same period, defence spending has been growing apace.

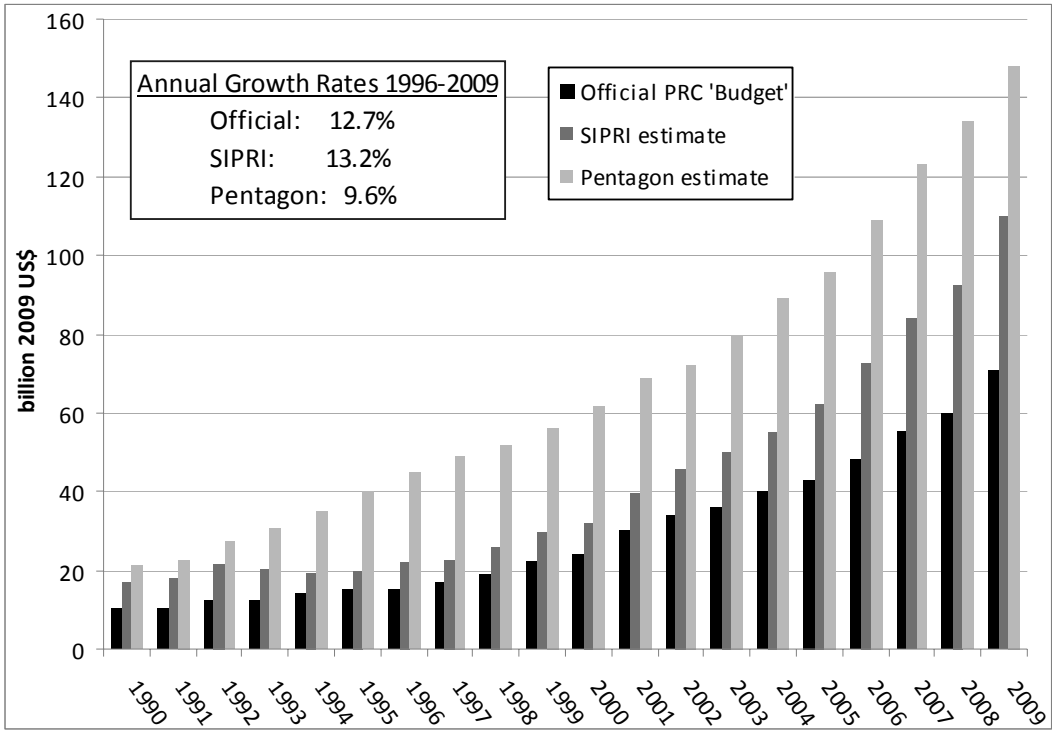
Controversy surrounds the scale of Chinese defence spending. US estimates of Chinese spending tend to be about twice that of the official figure. Independent estimates fall somewhere in between, see Figure 5.3. On the basis of US estimates, the Chinese defence budget is about 20% that of the United States.



By any estimate, Chinese defence spending is rising rapidly; between 10% and 13% each year above inflation over the past decade and a half. Nonetheless, the defence share of GDP has remained well below 2%.

Although China is often criticised (including by Australia) for not being transparent enough about its military build-up, its annual defence white papers are reasonably clear and largely consistent with what can be observed; China is developing the military capability to exclude the United States and its allies from its maritime approaches with a particular focus on operations against Taiwan. To a much lesser extent, China is investing in power-projection assets—including an aircraft carrier.

Figure 5.3: Chinese defence spending 1990 to 2009



Sources: Analysis of data from SIPRI Military Expenditure Database 2011, www.sipri.org; *Pentagon Report to Congress on the Military Power of the People's Republic of China*, FY2004 and FY2010.

United Kingdom

Like the United States, the United Kingdom has ramped up defence spending over the past decade (though nowhere near to the same extent). This trend is now being reversed as part of the rapid fiscal consolidation being undertaken by the new coalition government. The 2011 UK defence budget sets out real reductions in underlying defence spending (exclusive of the cost of deployments) reported as 8% over four years from 2010-11 to 2014-15.

The cuts to the defence budget were determined as part of the 2010 *Defence and Security Review*. As a result, the United Kingdom will be a much diminished military power. Key decisions included:

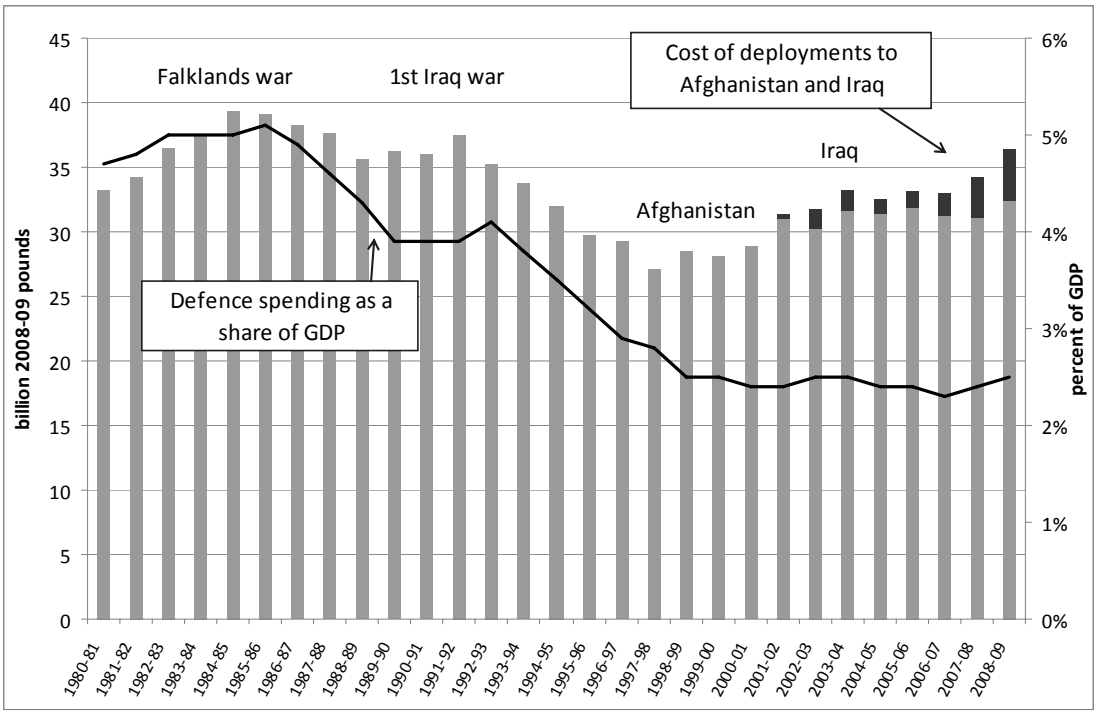
- Personnel reductions of 17,000 (from a base of 158,500), and withdrawal of land forces from Germany by 2020. Reduction in tank and heavy artillery numbers by 40% and 35% respectively.

- Immediate decommissioning of existing Aircraft Carrier, one Landing Platform Helicopter and one Land Ship Dock. Continuing with plans to build two new aircraft carriers but keeping one at 'extended readiness' (mothballing). Putting one existing Landing Platform Dock ship at 'extended readiness'.

- Scrapping of the *Nimrod* maritime patrol aircraft and *Harrier* jump-jet fleets. Cancellation of the planned purchase of F-35B VSTOL aircraft and a reduction in the number of *Chinook* helicopters to be purchased from 22 to 12.

- Five year delay in the replacement of ballistic missile submarine fleet and reduction in the number of warheads from 160 to 120.

Figure 5.4: United Kingdom defence spending 1980 to 2009

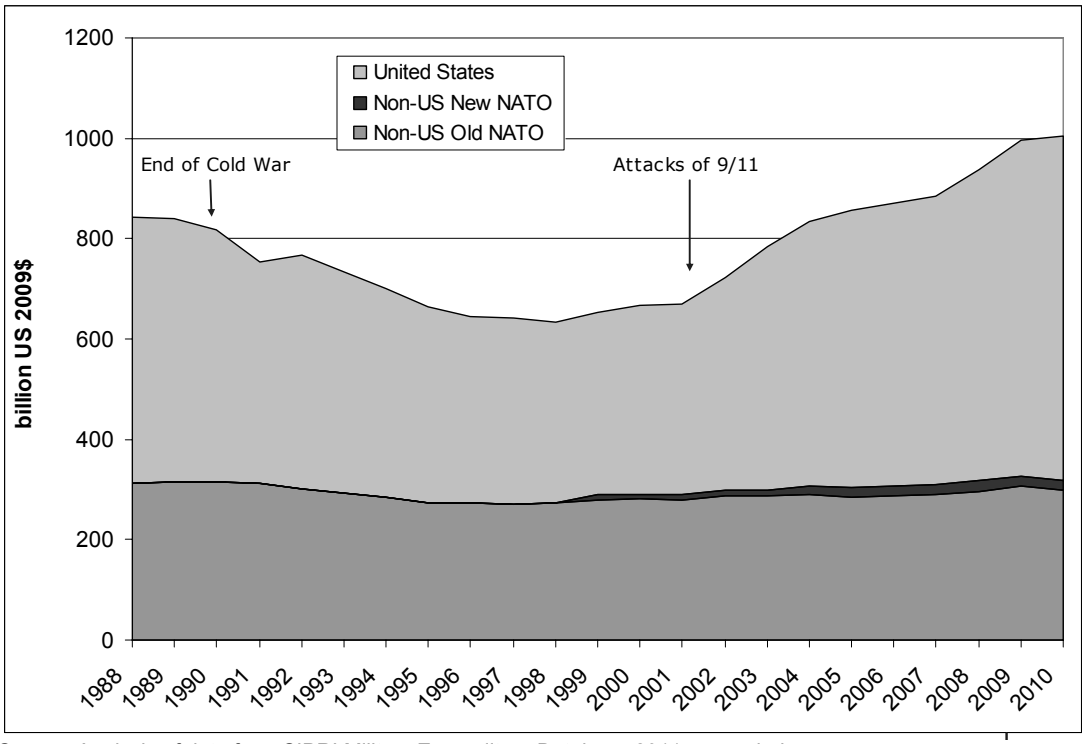


Source: UK House of Commons Library Report SN/SG/113, 2009

NATO

Aggregate defence spending by NATO (exclusive of the United States) has remained remarkably static in real terms since the end of the Cold War, and the subsequent expansion of NATO has done little to change the situation.

Figure 5.5: NATO defence spending 1988 to 2010



Source: Analysis of data from SIPRI Military Expenditure Database 2011, www.sipri.org

The larger members of NATO and the scale of their present defence spending are given in Table 5.1. In addition to the United States and United Kingdom, many other NATO members are under pressure to reduce defence spending due to fiscal pressures. In 2010 Italy reduced its defence budget by 10% following earlier cuts in 2009. Also in 2010, Spain reduced their defence budget by 3.5%. France plans to reduce spending by around 4% between 2011 and 2013 and Germany has decided to end conscription as of June 2011. Because these countries are subject to the same cost pressures as the United States, the scale of NATO forces will continue to decline in the years ahead making it even more difficult to undertake operations such as that in Afghanistan today.

Table 5.1: Key NATO member's defence spending 2009

	United States	United Kingdom	France	Germany	Italy	Canada	Spain	Netherlands
Defence spending as a share of GDP	4.7%	2.7%	2.1%	1.4%	1.4%	1.5%	1.2%	1.5%
Defence spending in 2009 US$ billions	661	59.1	54.4	47.5	30.5	19.6	16.9	12.1

Source: IISS, *The Military Balance 2011*.

Regional trends

Defence spending trends in Maritime Southeast Asia and Greater Asia are summarised on the following two pages and examined in depth overleaf.

Maritime Southeast Asia

Defence spending for 2010 in the seven largest Southeast Asian states plus Australia is plotted in Figure 5.6 and further detailed in Table 5.2. Several points are worth making. (1) Australia outspends any of its neighbours by a comfortable margin. (2) Only Singapore shows any real sign of strategic angst with a GDP share of 4.3%. (3) Only Australia, New Zealand and Thailand are increasing their defence spending at a rate sufficient to expand their armed forces (and then only modestly).

Figure 5.6: Defence spending 2010 in Maritime Southeast Asia

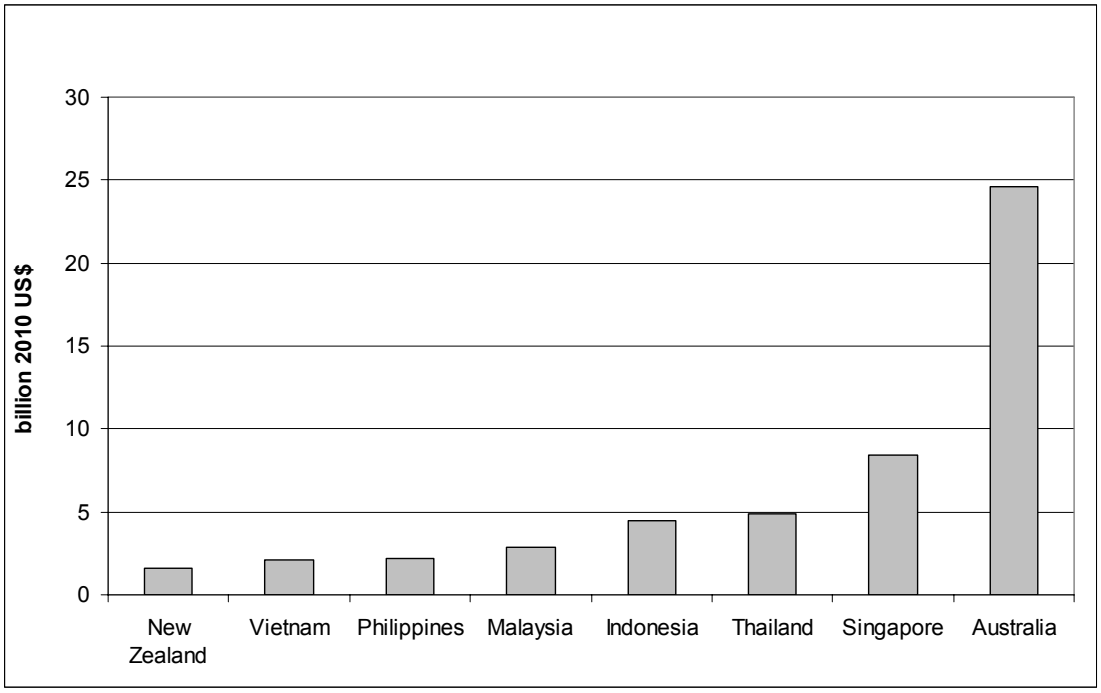


Table 5.2: Defence spending 1988 to 2010; Maritime Southeast Asia

	New Zealand	Vietnam	Philippines	Malaysia	Indonesia	Thailand	Singapore	Australia
2009/10 defence spending as a share of GDP	1.15%	2.20%	0.85%	2.01%	0.89%	1.79%	4.29%	2.0%
Average annual defence spending growth 2000-2010	4.6%	-3.7%	2.9%	2.0%	2.8%	4.4%	2.8%	4.9%
Average annual defence spending growth 1990-2000	-3.3%	-	-1.4%	3.0%	2.8%	-1.5%	5.9%	1.6%

Sources: GDP share taken from IISS Military Balance 2011.
Note: defence spending growth is measured in own currency.

Greater Asia

Defence spending for 2010 in the six largest Greater Asian states plus Australia is plotted in Figure 5.7 and further detailed in Table 5.3. Several points are worth making. (1) Australia is a minnow in the tank of North Asian security. (2) Only India and South Korea shows any real sign of strategic concern with GDP shares of 2.7% and 3.1% respectively. (3) Taiwan and Japan are allowing their defence capabilities to atrophy. (4) Although China devotes less than 1.5 % of GDP to Defence, it has been increasing its defence spending at an impressive rate over the past two decades.

On the basis of defence spending, it is clear that the balance of military power in the region is slowly shifting from the United States and its allies to the China.

Figure 5.7: Defence spending 2010 in Greater Asia

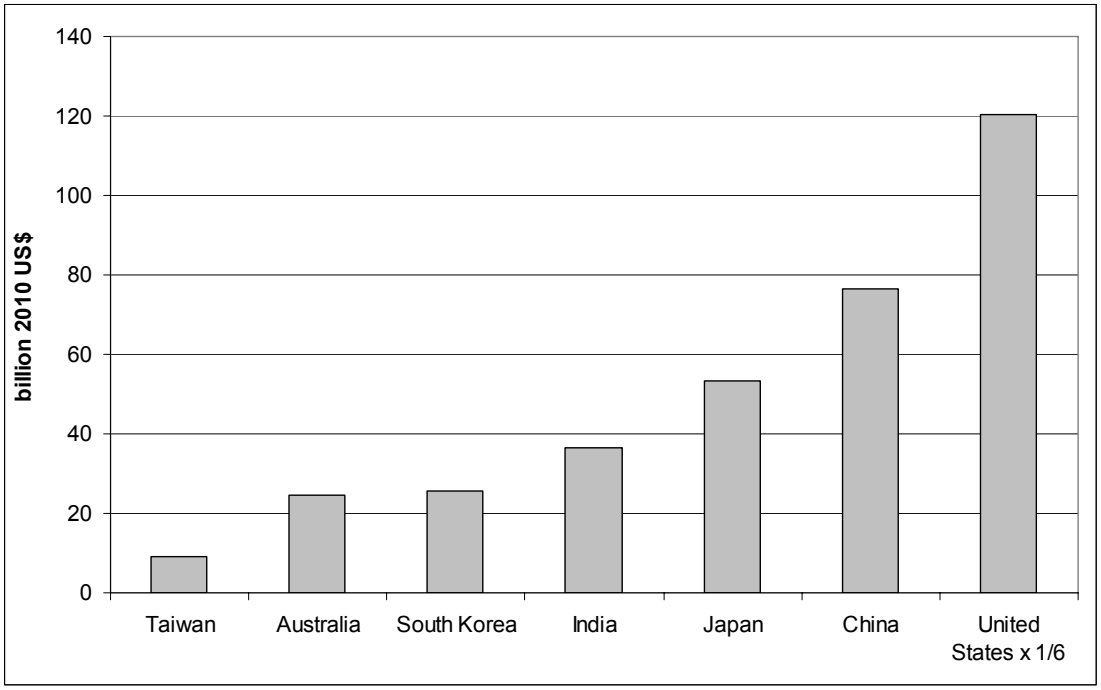


Table 5.3: Defence spending 1988 to 2010; Greater Asia

	Taiwan	Australia	South Korea	India	Japan	China	United States
2009/10 defence spending as a share of GDP	2.5%	2.0%	2.68%	3.11%	1.01%	1.45%	4.68%
Average annual defence spending growth 2000-2010	-1.7%	4.9%	4.1%	4.9%	-0.2%	13.3%	6.5%
Average annual defence spending growth 1990-2000	1.4%	1.6%	2.6%	4.6%	0.9%	7.6%	-2.7%

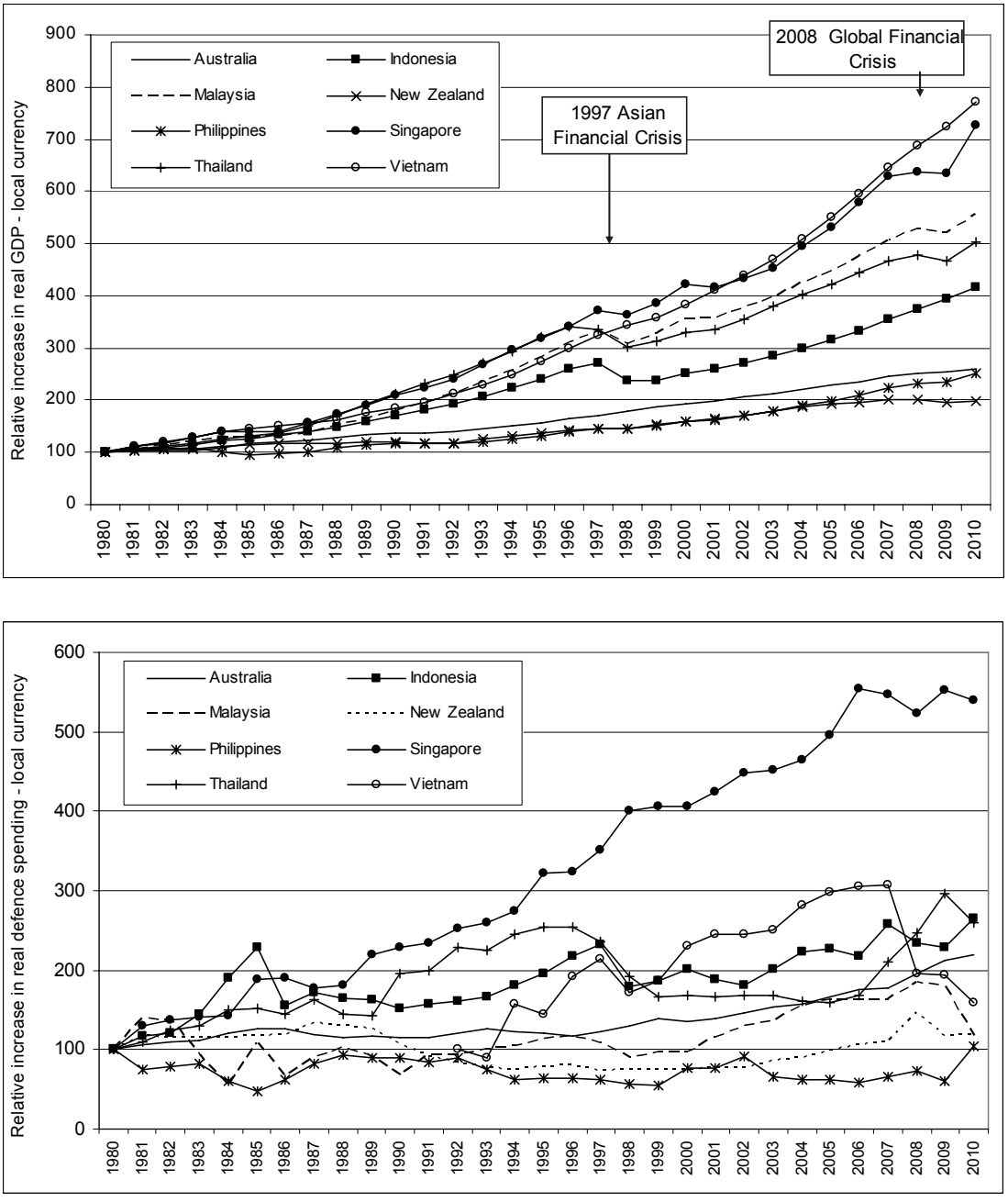
Sources: GDP share taken from IISS Military Balance 2011.
Note: defence spending growth is measured in own currency.

Regional economic and defence spending trends – the details

The least ambiguous way to track *relative changes* in the size of a country's economy is to adjust its GDP in local currency to a single base-year using its GDP-deflator. Similarly, the least ambiguous way to track *relative changes* in defence spending is to adjust spending in local currency to a single base year using its CPI index.

With 'real' GDP and defence spending so calculated, the relative growth between countries can be compared by normalising the initial values in the base year. This has been done for a selection of countries in Maritime Southeast Asia and Greater Asia in Figures 5.8 and 5.9. Data sources for these and subsequent graphs are listed at the end of this section.

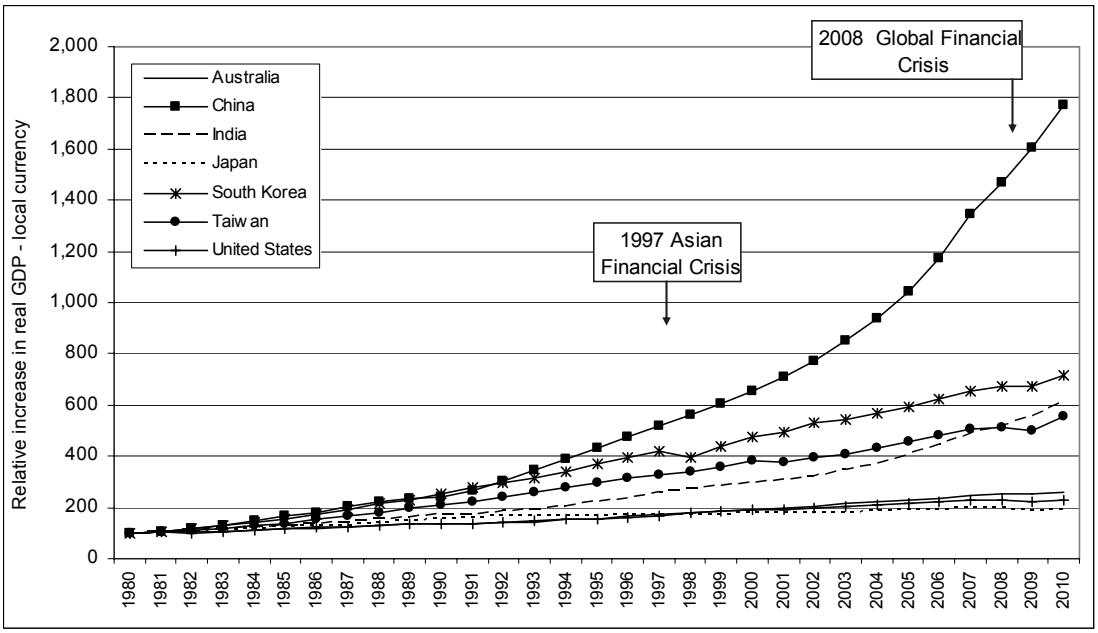
Figure 5.8: **Relative economic and defence spending growth, Maritime Southeast Asia**

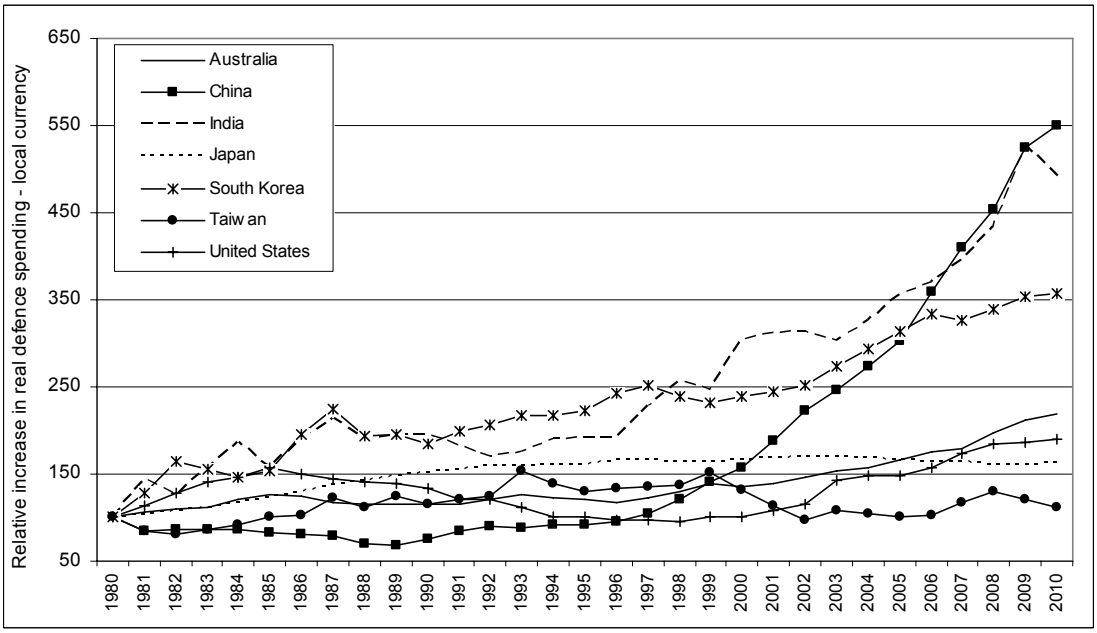


It is clear that developing countries have achieved faster economic growth than their more-developed counterparts. China in particular has achieved spectacular economic growth since the early 1990s—though its military spending did not take off until around a decade later. Among the countries of Maritime Southeast Asia, Singapore has managed steady economic growth which has been reflected in a similar trend in their defence spending. In comparison, our closest neighbour, Indonesia, has achieved healthy economic growth but has not taken the opportunity to increase its defence spending.

The impact of the 1997 Asian Financial Crisis is apparent in Figure 5.8 and to a lesser extent in Figure 5.9.

Figure 5.9: **Relative economic and defence spending growth, Greater Asia**

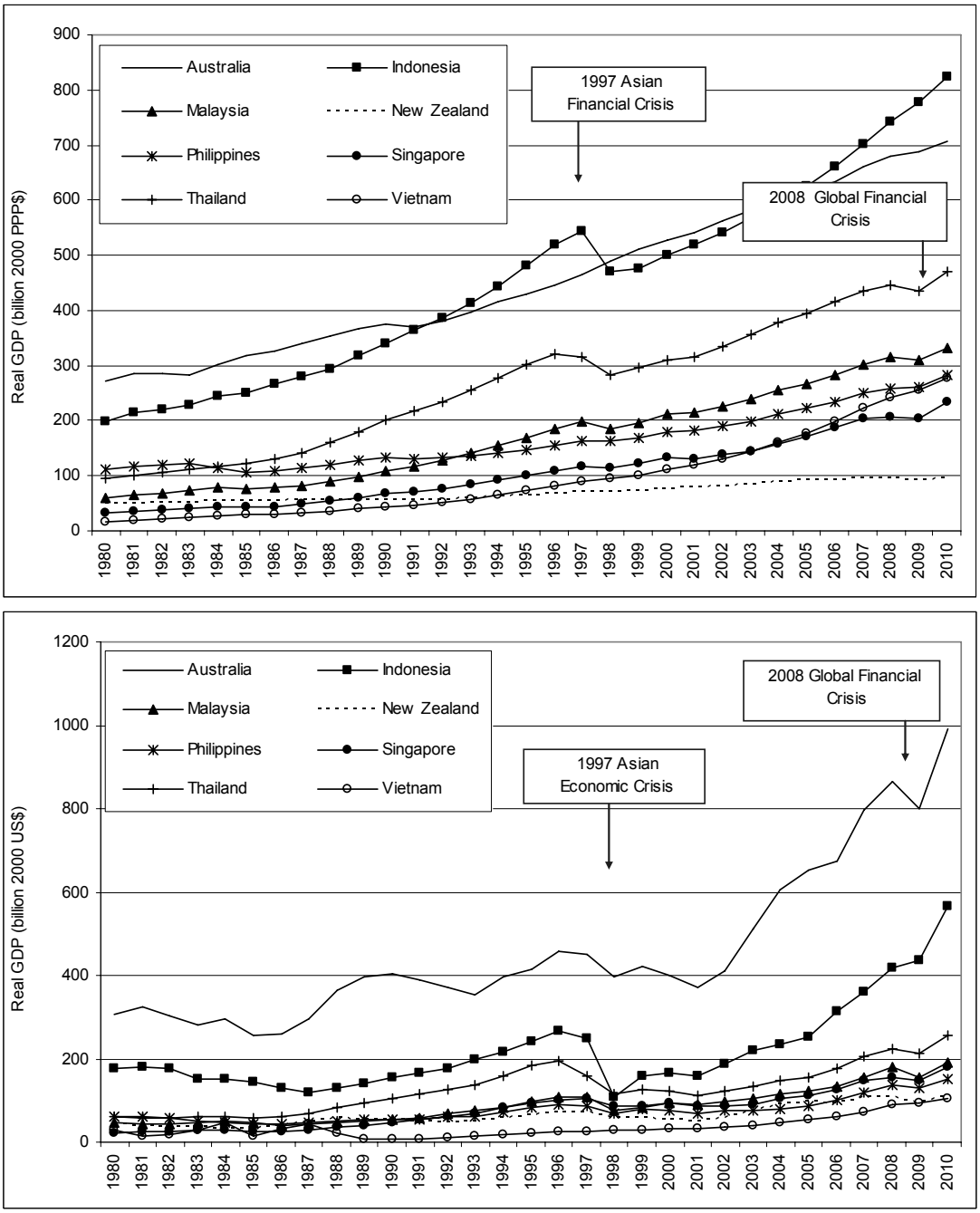




Comparative economic performance

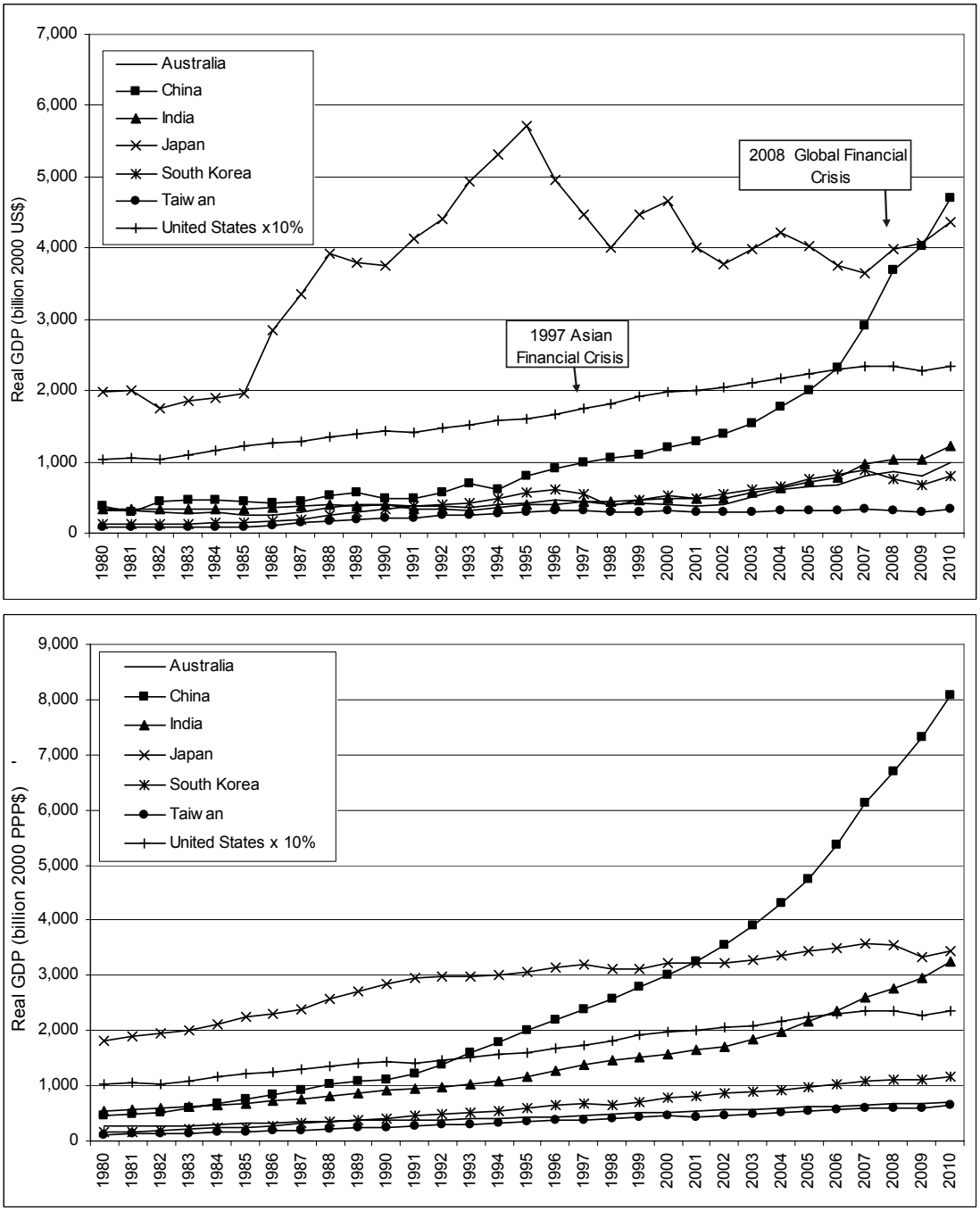
Comparing the relative size of economies (as opposed to the relative rate of growth in size) requires converting the domestic currencies involved to a common currency. In practice, this is performed in one of two ways; either by converting to US dollars at prevailing market exchange rates, or by using the World Bank's Purchasing Power Parity (PPP) exchange rates which attempt to capture the buying power of the currency within the country it is used. Typically, PPP exchange rates yield a significantly larger figure for developing countries than market exchange rates. By construction, PPP exchange rates are normalised relative to the US dollar. Figure 5.10 and 5.11 plot national GDP at market exchange rates and PPP for Maritime Southeast Asia and Greater Asia respectively.

Figure 5.10: **Comparative economic performance, Maritime Southeast Asia**



Whether market exchange rates or PPP exchange rates present a more accurate picture of comparative economic performance is debatable. In some sense, they provide complementary views of what is occurring. That said; the substantial volatility of international exchange rates (which are driven more by near-term financial factors than long-term economic fundamentals) introduces large transient vagaries into time-series. For example, the rapid rise of Australian GDP in terms of US$ in Figure 5.9 and the oscillation of Japanese GDP in terms of US$ in Figure 5.11 are both artefacts of exchange rate fluctuations rather than any reflection of actual changes in economic performance. Note that in Figure 5.11 the size of the United States economy has been scaled by a factor of ten to accommodate it on the chart without compressing the data for other countries.

Figure 5.11: **Comparative economic performance, Greater Asia**



Comparative defence spending—Maritime Southeast Asia

Just as was the case with GDP, comparing the level of defence spending between countries requires conversion to a common basis, usually either US$ or PPP$. In terms of maintaining modern high-tech military capabilities, spending expressed in US$ is probably a better comparative measure. Conversely, the cost of maintaining a large low-tech defence force is probably better compared using PPP exchange rates. Figures 5.13 and 5.14 plot defence spending in Maritime Southeast Asia from 1980 to the present in terms of US$ and PPP$ respectively.

The only countries to consistently and significantly increase their defence spending post-Cold War are Australia, Singapore and Vietnam. All the others have either decreased their spending or are still working to recover ground lost in the 1997 Asian Financial Crisis. An equally sanguine picture emerges from the trends in the share of GDP devoted to defence. The long-term trend for all the countries of Maritime Southeast Asia is one of declining defence burden, see Figure 5.12. Even for those countries with the fastest growth—Singapore and Australia—GDP share has not been growing by an appreciable amount in recent years.

At the risk of contradicting those who discern a 'regional arms race', there is little in the defence spending patterns of Maritime Southeast Asia to support such a conclusion. Given that the cost of high-tech military equipment is increasing by around 4% above inflation every year, it is hard to see how anyone other than Australia and Singapore can afford to modernise or significantly expand their air and naval assets on present spending trends.

Figure 5.12: **Defence burden, Maritime Southeast Asia**

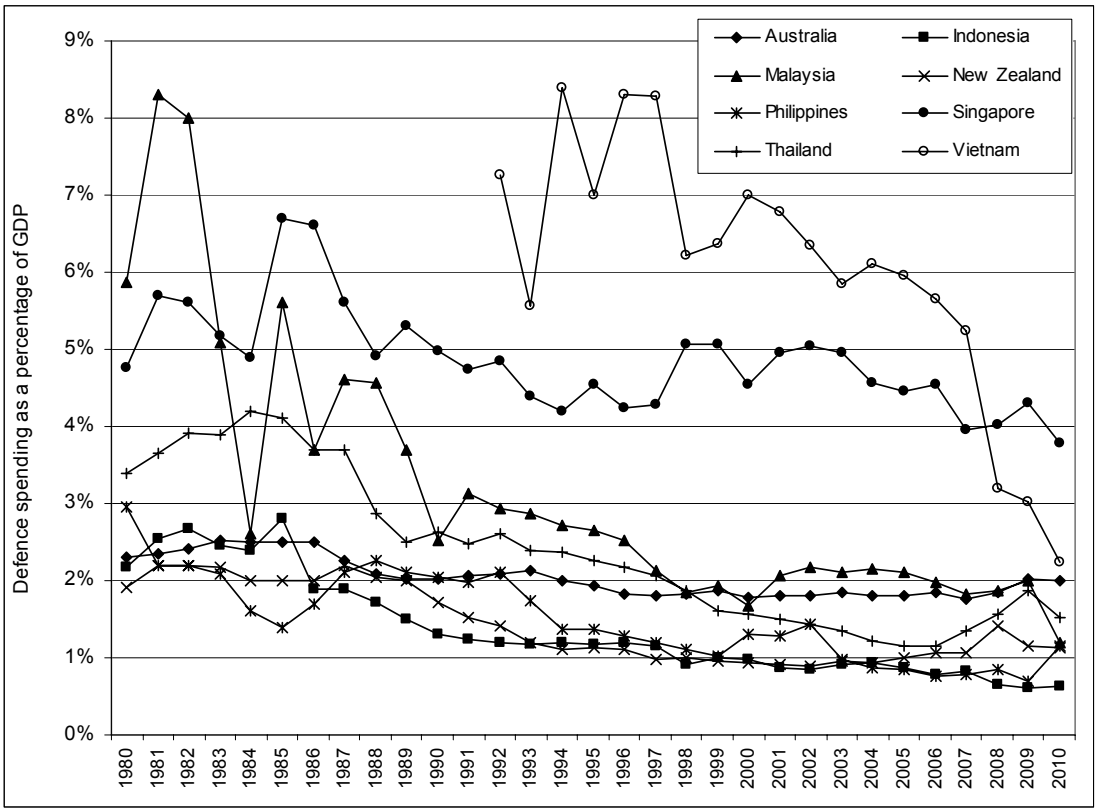


Figure 5.13: **Real defence spending (2000 US$), Maritime Southeast Asia**

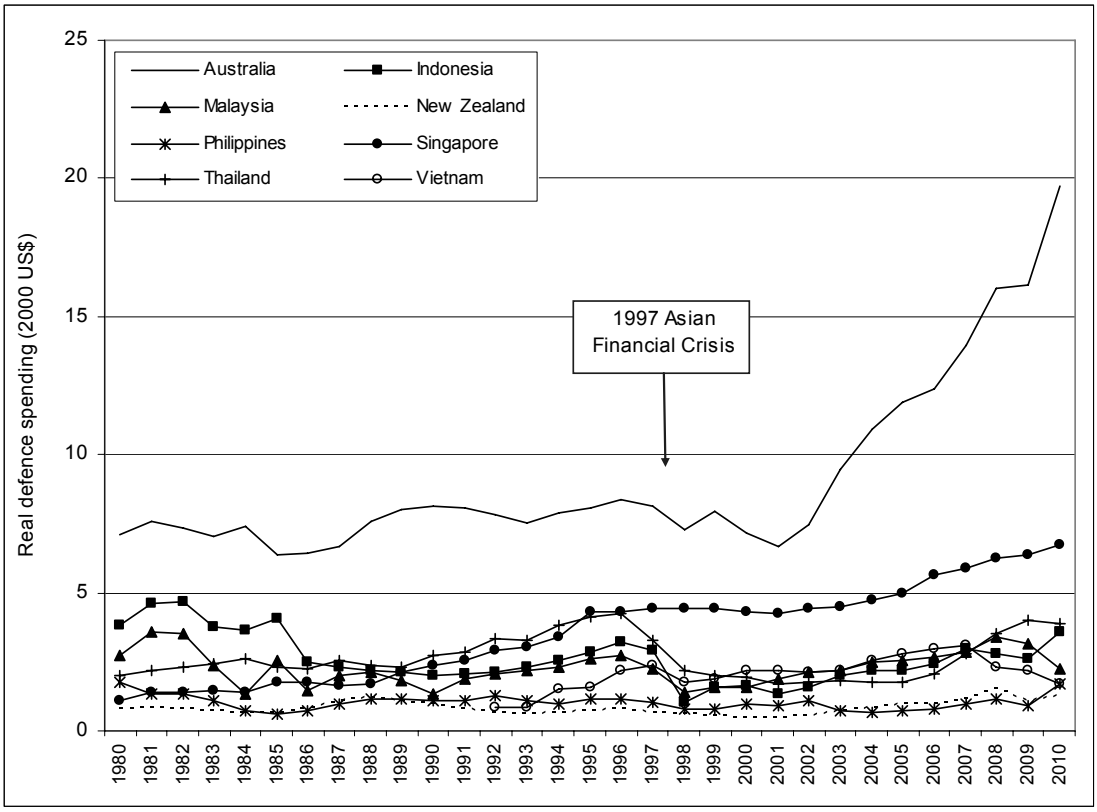
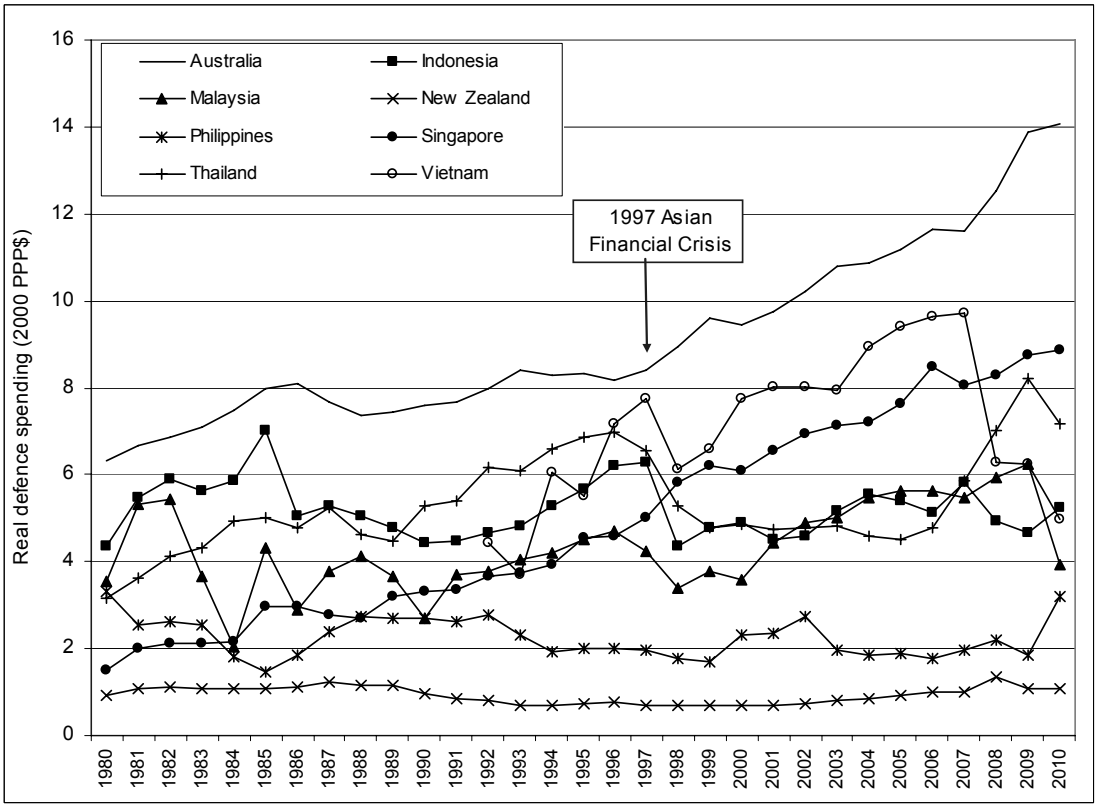


Figure 5.14: **Real defence spending (2000 PPP$), Maritime Southeast Asia**



Comparative defence spending—Greater Asia

A somewhat more interesting picture emerges of defence spending in Greater Asia and the United States. The strongest and clearest trend has been the steady and substantial decline in the defence burden carried by countries since 1980, see Figure 5.15. The only countries to exhibit a significant rise in defence burden in the nearer-term (albeit limited compared with historical levels) are China from the late 1990s and the United States from 2001 onwards.

In terms of absolute spending levels (see Figures 5.16 and 5.17) several points are worth making. China's defence spending has grown appreciably by any measure. The United States remains far ahead of any other country but having reduced its spending through the late 1980s and 1990s is now ramping up at a rate only a little slower than China. India's defence spending continues to rise as does South Korea's. Taiwan has given up.

Unlike Maritime Southeast Asia, it is clear that the military balance of power is slowly but surely shifting among Greater Asia and the United States—to the extent that defence spending translates into military capability. China has comfortably overtaken Taiwan, South Korea and India, and recently Japan. Critically, the Chinese spending figures presented here are taken from official sources and are deemed by many observers to understate the true picture. The latest US Pentagon report to Congress on Chinese Military Power argues that defence spending by the People's Republic is appreciably larger than disclosed.

Figure 5.15: **Defence burden, Greater Asia**

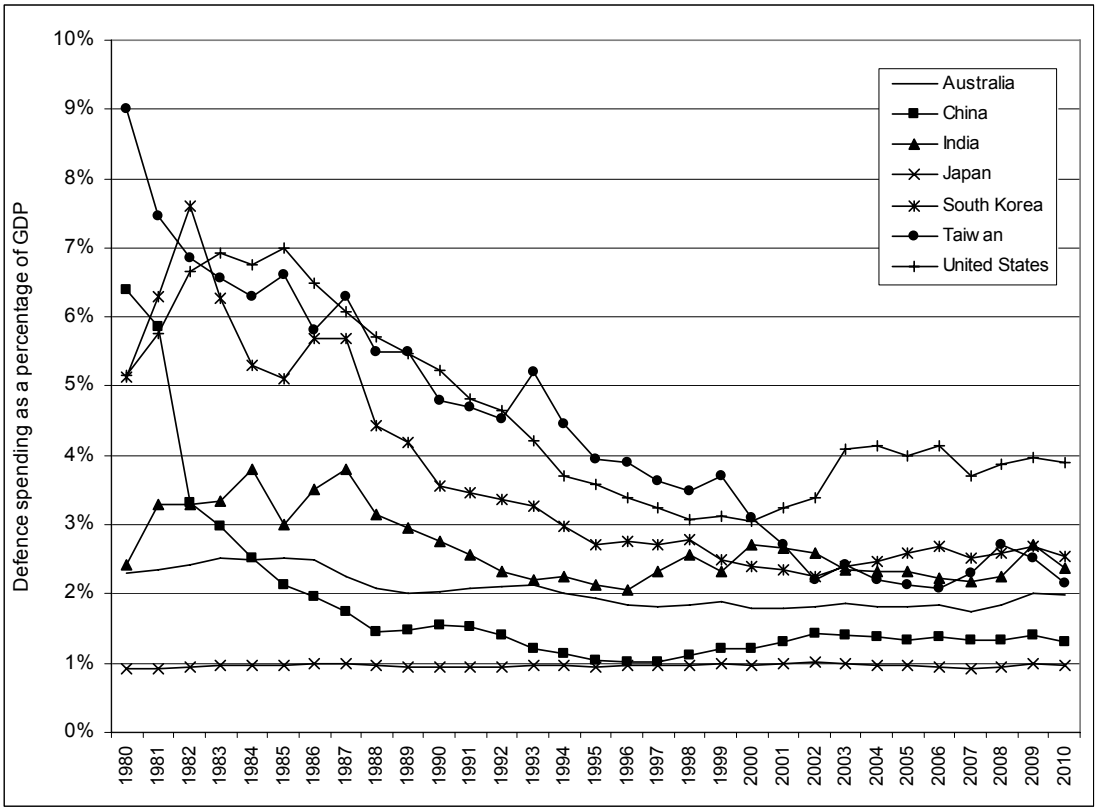


Figure 5.16: **Real defence spending (2000 US$), Greater Asia**

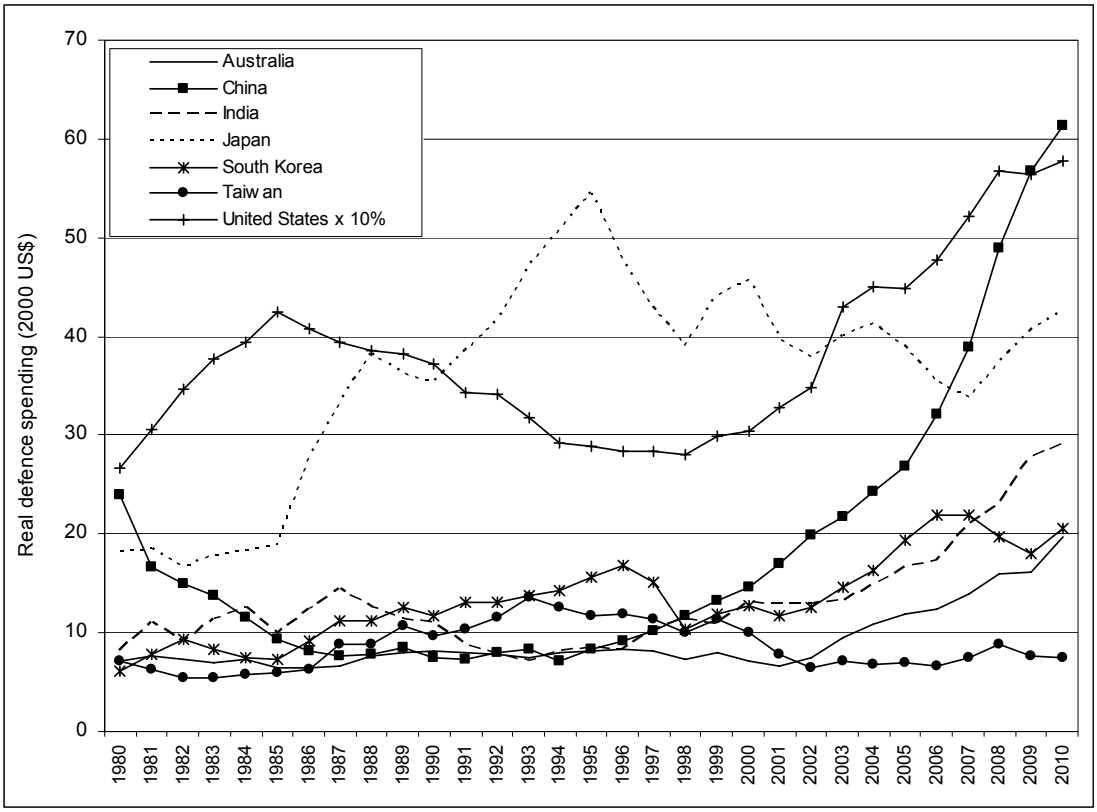
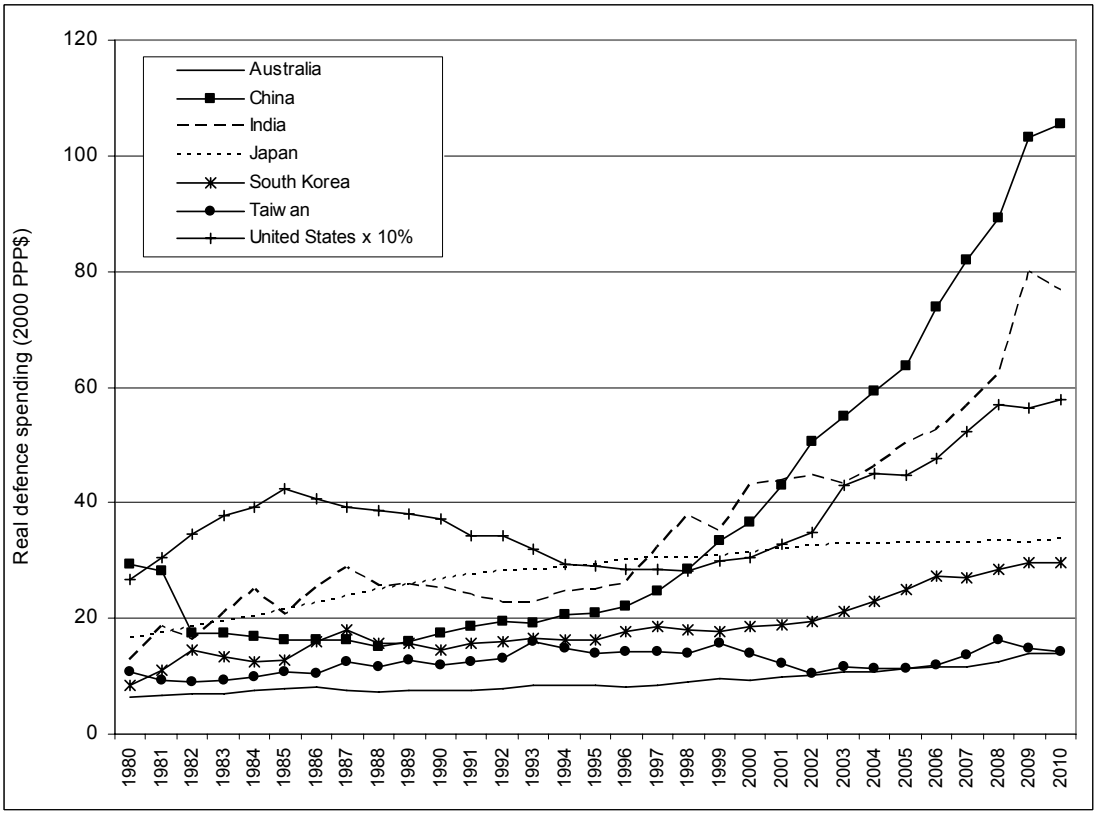


Figure 5.17: Real defence spending (2000 PPP$), Greater Asia

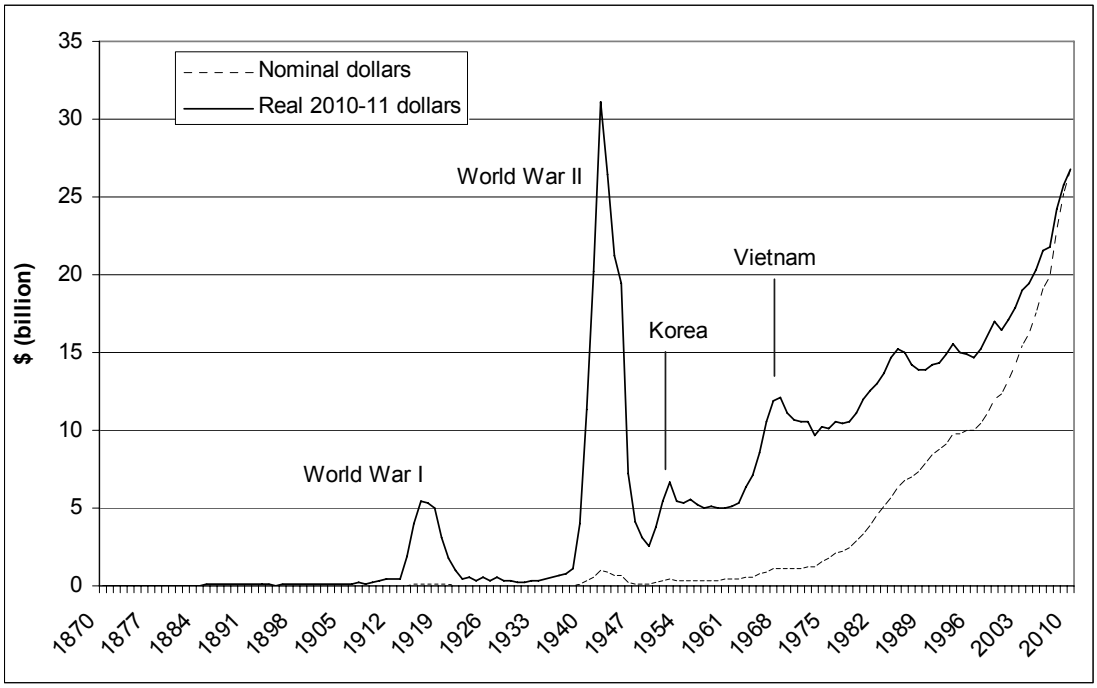


Historical Defence Spending

Historical Australian defence spending

Real and nominal Australian defence spending from 1870 to the present appears in Figure 5.18. Although inflation dominates the nominal data and obscures much of the historical detail, the impact of the wars of the twentieth century is clearly visible in the 'real' data corrected for inflation.

Figure 5.18: Australian defence spending, 1870–2010.

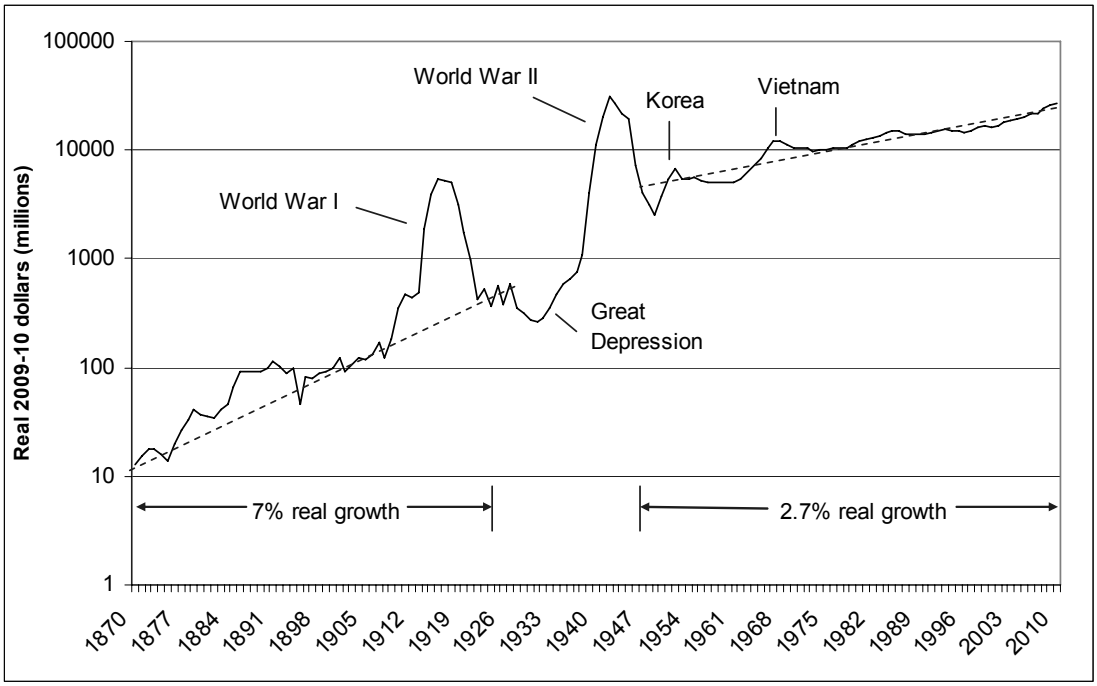


Source: ASPI collation of data from various sources, real dollars calculated using retail/consumer price index.

An even more useful graph of historical spending appears in Figure 5.19 where real spending has been plotted on a logarithmic scale, where exponential growth (which is close to compounding growth for small rates of increase) appears as a straight line. As shown in Figure 5.19, there have been two epochs of underlying steady growth in defence spending; from 1870 to 1929 spending grew by around 7% per annum, and from 1945 to the present underlying spending grew by around 2.7% per annum.

None of this should be taken to imply that the defence force has expanded significantly during the post-war period—it has not. Rather, the observed growth in defence spending largely reflects the rising intrinsic cost of delivering modern military capability. The 2003 ASPI publication, *A Trillion Dollars and Counting,* estimated that real growth of around 2.65% per annum was necessary just to maintain the present scale and range of capabilities in the ADF. Comparable analysis of US defence spending and force structure trends leads to a similar conclusion. Thus, the recent and ongoing rise of 3% per annum is more about maintaining than significantly expanding the defence force.

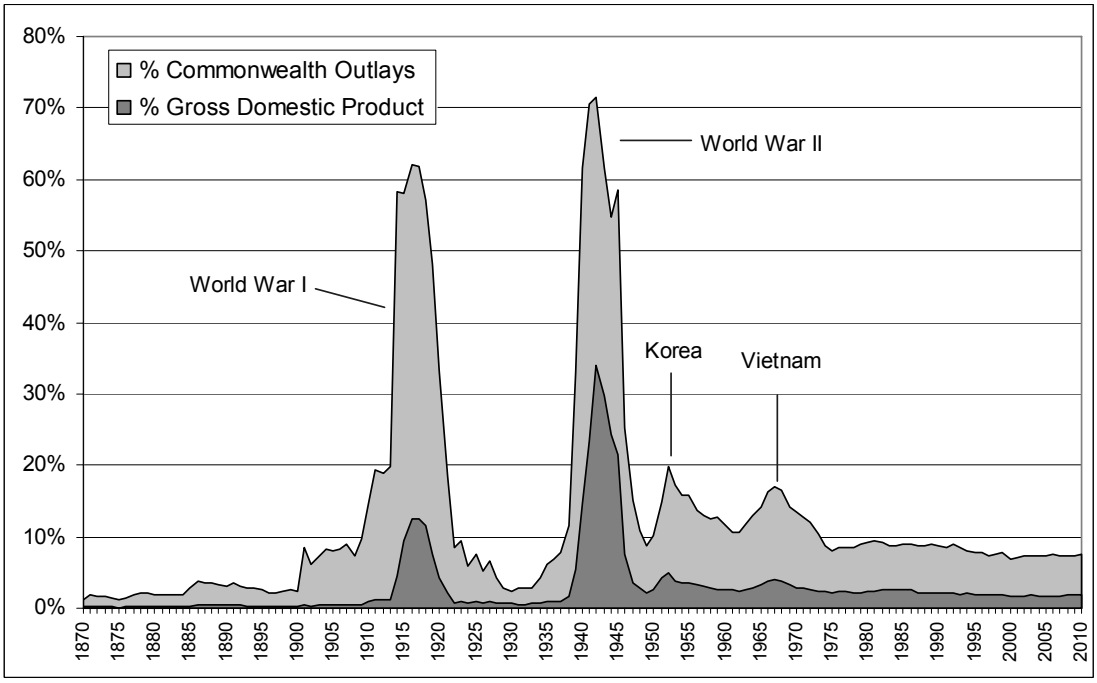
Figure 5.19: Australian defence spending, 1870–2010.



Source: ASPI collation of data from various sources, real dollars calculated using retail/consumer price index.

The steady increase in real defence spending since the end of the Second World War has been possible because of ongoing growth in the Australian economy over the same period. In fact, as a share of Gross Domestic Product (GDP) the longer-term trend has been for defence spending to account for a progressively smaller share of domestic output. Figure 5.20 plots defence spending as both a share of GDP and as a proportion of total Commonwealth outlays.

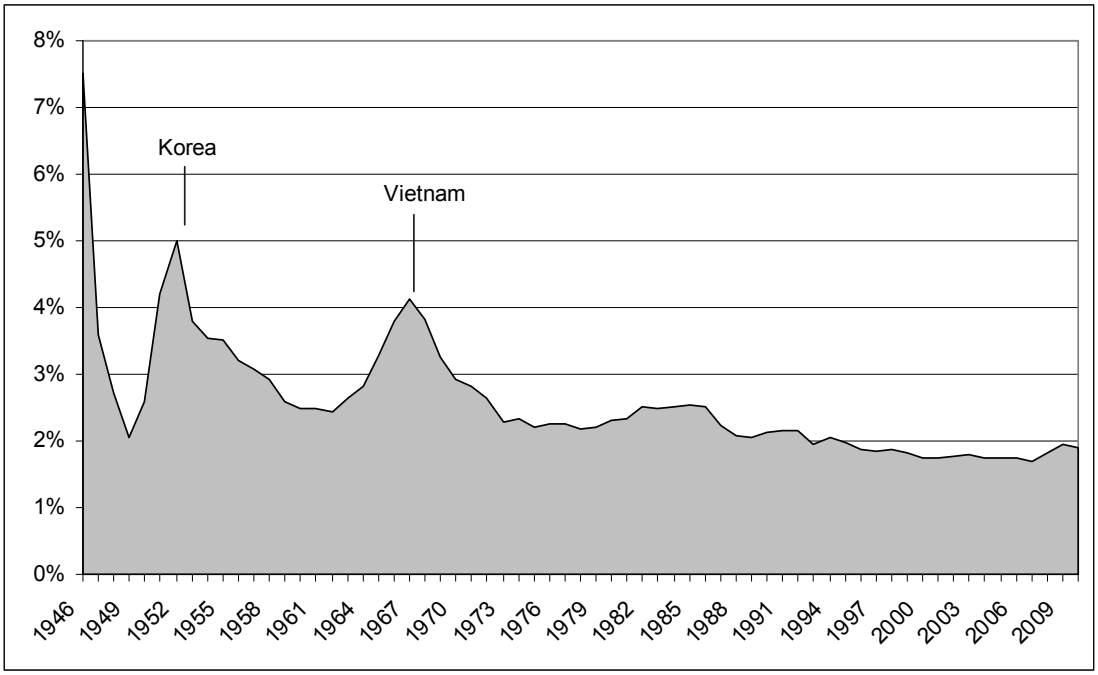
Figure 5.20: Australian defence spending as a share of GDP and Outlays.



Source: ASPI collation of data from various sources.

Given the importance of defence spending as a share of GDP, a magnification of the post-war period has been prepared in Figure 5.21.

Figure 5.21: Defence burden (per cent of Gross Domestic Product) 1945–2010



Source: ASPI collation of data from various sources.

GDP share is not a measure of the adequacy or otherwise of defence spending—that's something that depends on the task at hand. Rather, it measures the proportion of national wealth that a nation devotes to defence. Often, this is captured by the use of the term 'defence burden'.

The planned growth in Australian defence spending will see the share of GDP devoted to national defence at around 1.75% by 2030 (see the 2010 Intergenerational Report) which is not high by recent standards. Moreover, the United States is presently expending more than 4% of GDP and the United Kingdom 2.3%.

Even taking account of the growing fiscal burden due to the ageing of the Australian population, there is no reason to conclude that a defence burden in the range of 2% to 3% is unsustainable. While it is true that health and ageing will steadily demand a growing share of GDP in the decades ahead, the concurrent rise in individual prosperity (as measured by GDP per-capita) will allow living standards to grow appreciably even if a larger share of national product is diverted for public goods like health, aged care and defence.

A more detailed examination of the affordability of Australian defence spending can be found in the 2008 ASPI publication *Strategic choices: Defending Australia in the 21st century*.

Australia's defence effort in an international context

According to the International Monetary Fund, in 2008 Australia had the fifteenth largest economy on earth measured at market exchange rates (and seventeenth using Purchasing Power Parity—PPP). From this annual bounty of around 1.4 trillion

dollars, Australia finds the money to fund its defence. Table 5.4 displays Australia's 2009 defence spending (the latest year for which comprehensive data is available) along with that of a selection of countries including allies, regional neighbours and other developed industrial economies around the globe. All figures are given in US dollars calculated at prevailing market exchange rates.

Table 5.4: Defence spending and burden 2009

2009 GDP		2009 Defence expenditure		% GDP	
Country	**$US(b)**	**Country**	**$US(b)**	**Country**	**%**
USA	14,125	USA	661	Israel	6.91
Japan	5,058	China	70.4	USA	4.68
China	4,854	United Kingdom	59.1	Singapore	4.29
Germany	3,343	France	54.4	India	3.11
France	2,659	Japan	51.1	Russia	3.10
United Kingdom	2,182	Germany	47.5	Pakistan	2.97
Italy	2,117	Russia	38.3	United Kingdom	2.71
Spain	1,473	India	38.3	South Korea	2.68
Canada	1,341	Italy	30.9	Taiwan	2.5
Russia	1,235	South Korea	22.4	Vietnam	2.2
India	1,231	Canada	19.6	France	2.05
Australia	976	Australia	19.5	Malaysia	2.01
South Korea	837	Spain	16.9	Australia	2.00
Netherlands	798	Israel	13.5	Thailand	1.79
Turkey	614	Netherlands	12.1	Turkey	1.77
Indonesia	542	Turkey	10.8	Netherlands	1.52
Sweden	408	Taiwan	9.5	Canada	1.46
Taiwan	380	Singapore	7.8	China	1.45
Thailand	264	Sweden	5.3	Italy	1.44
Israel	195	Indonesia	4.8	Germany	1.42
Malaysia	193	Thailand	4.7	Sweden	1.30
Singapore	182	Pakistan	4.4	New Zealand	1.15
Philippines	160	Malaysia	3.9	Spain	1.15
Pakistan	149	Vietnam	2.1	Japan	1.01
New Zealand	118	New Zealand	1.4	Indonesia	0.89
Vietnam	97	Philippines	1.4	Philippines	0.85
PNG	8	PNG	~	PNG	0.50

Source: International Institute for Strategic Studies: *The Military Balance*, 2011. Note Australian results vary somewhat from local reporting.

With the caveat that fluctuation in exchange rates can make a significant difference in relative ranking, there are three observations worth making. First, our level of defence spending gives us a budget broadly comparable with South Korea and the Netherlands, but far below heavy hitters like Italy, Germany, UK, Japan, France and China. Second, we out-spend all our Southeast Asian neighbours by a considerable margin. Third, the United States remains in a class of its own.

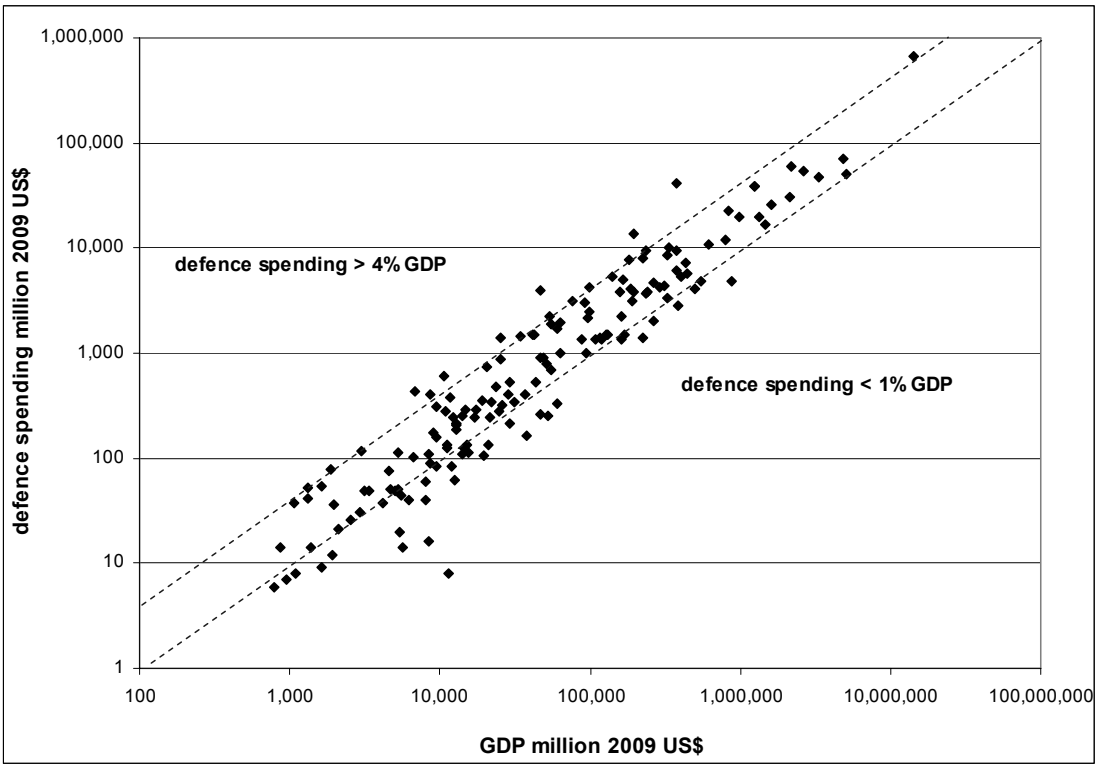
In terms of defence spending as a percentage of GDP, we devote significantly more than the Netherlands (1.5%), Germany (1.4%), Spain (1.2%), Canada (1.5%) and Japan (1.1%). According to the data, the only fully developed Western countries to

allocate a larger share of GDP than us are the United States (4.7%), France (2.1%) and the United Kingdom (2.7%). Closer to home, we devote a smaller share of GDP than Vietnam (2.2%), India (3.1%), South Korea (2.7%), and Singapore (4.3%), but more than Indonesia (0.9%), Thailand (1.8%) and the Philippines (0.9%). Not surprisingly, we rank well ahead of New Zealand (1.2%).

To summarise, we spend a greater share than most developed Western nations but a lesser share than many of our significant regional neighbours. This probably reflects two things: (1) the synergy derived from collective defence in Western Europe, and (2) that some of our poorer neighbours have to spend a larger share of GDP to meet the demands of a more challenging strategic environment than that of Western Europe.

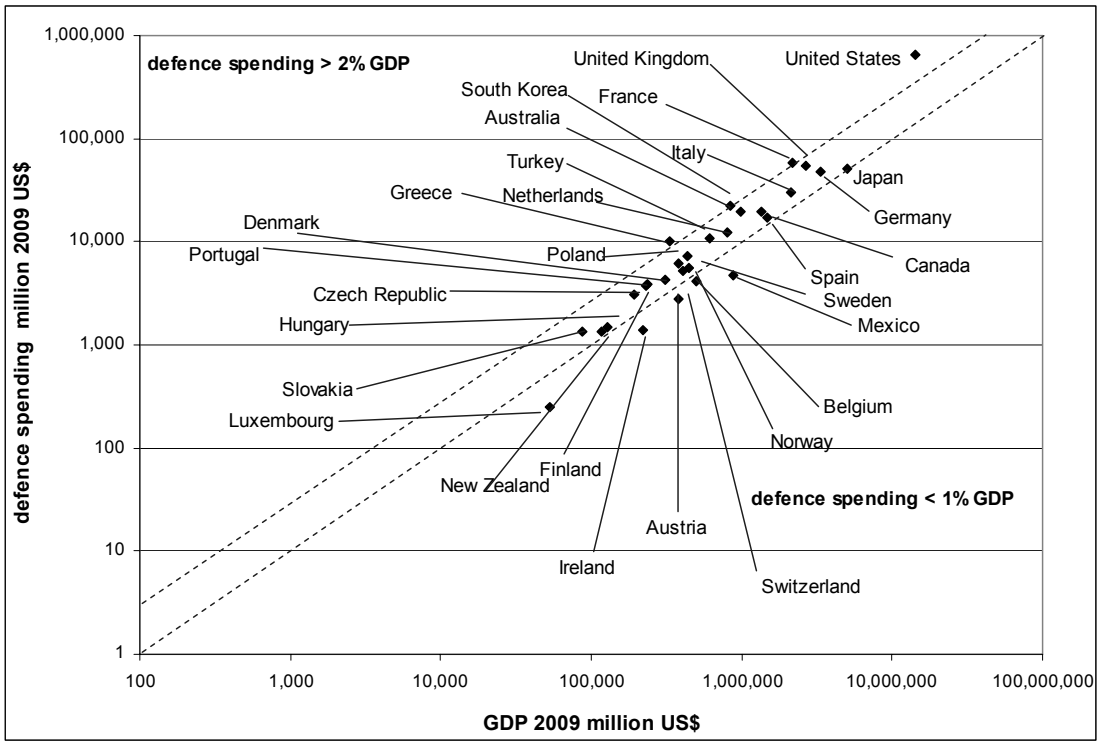
An alternative and often illuminating depiction of the economic resources a country allocates to defence can be achieved by plotting its position on a graph of GDP against defence spending along with other nations. We've done this in Figure 5.22 for some 156 countries based on data collected by the International Institute of Strategic Studies (IISS). In Figure 5.23 we've isolated the results for (mainly) OECD countries. To properly capture the wide spread of GDP and defence spending values, the data has been plotted on a dual logarithmic scale.

Figure 5.22: GDP and defence spending for 156 countries 2009



Source: Compiled from data in International Institute for Strategic Studies: *The Military Balance*, 2011.

Figure 5.23: GDP and defence spending – OECD 2008



Source: Compiled from data in International Institute for Strategic Studies: *The Military Balance*, 2011.

A couple of things are immediately apparent. Most obviously, there is a clear correlation between defence spending and economic size; the larger a nation's economy the more it tends to spend on defence. In addition, the vast bulk of nations spend within the band of between 1 and 4% of GDP on defence. Not surprisingly, those countries that spend larger shares of GDP tend to have more challenging strategic circumstances than those that spend less, or else they are impoverished nations that need to spend a greater share of their meagre resources to achieve a credible capability. Small shares of GDP spending tend to correlate with advantageous geography, strong alliances and benign neighbours. But another factor is also at play. Economically prosperous developed nations tend, understandably, to be able to provide for their defence with a smaller share of GDP.

Money is not the only resource that a nation has available to devote to its defence; there is also people. Table 5.5 lists population numbers, permanent defence force numbers and population percentage in the armed services for our selection of allies, neighbours and Western powers.

Here Australia is less well endowed. According to the *CIA Factbook*, Australia ranked 55th in population in 2010, ahead of Cote d'Ivoire and below Romania. We have about one-third the population of the larger European powers and less than one-tenth that of the US. In regional terms, we're just a little smaller than Malaysia, North Korea and Taiwan, but only a quarter the size of Thailand and the Philippines. Indonesia has more than ten times our population, and we are but a drop in the ocean compared with India and China. The sobering fact is that we account for less than one-third of one percent of the world's people.

Table 5.5: Human resources circa 2011

Country	POP 2011	Country	Armed Forces 2011	Country	% of POP
China	1,336,718,015	China	2,285,000	North Korea	4.87%
India	1,189,172,906	United States	1,564,000	Israel	2.37%
United States	313,232,044	India	1,325,000	Singapore	1.54%
Indonesia	245,613,043	North Korea	1,190,000	South Korea	1.34%
Pakistan	187,342,721	Russia	1,046,000	Taiwan	1.26%
Russia	138,739,892	South Korea	655,000	Russia	0.75%
Japan	126,475,664	Pakistan	617,000	Turkey	0.71%
Philippines	101,833,938	Turkey	511,000	Vietnam	0.50%
Vietnam	90,549,390	Vietnam	455,000	United States	0.50%
Germany	81,471,834	France	239,000	Thailand	0.46%
Turkey	71,892,807	Thailand	306,000	Malaysia	0.38%
Thailand	66,720,153	Indonesia	302,000	France	0.37%
France	65,312,249	Italy	185,000	Pakistan	0.33%
United Kingdom	62,698,362	Taiwan	290,000	Germany	0.31%
Italy	61,016,804	Germany	251,000	Spain	0.30%
South Korea	48,754,657	Japan	248,000	Italy	0.30%
Spain	46,754,784	Israel	177,000	United Kingdom	0.28%
Canada	34,030,589	United Kingdom	178,000	Australia	0.27%
Malaysia	28,728,607	Spain	142,000	New Zealand	0.23%
North Korea	24,457,492	Philippines	125,000	Sweden	0.23%
Taiwan	23,071,779	Malaysia	109,000	Netherlands	0.22%
Australia	21,766,711	Singapore	73,000	Japan	0.20%
Netherlands	16,847,007	Canada	66,000	Canada	0.19%
Sweden	9,088,728	Australia	59,000	China	0.17%
Israel	7,473,052	Netherlands	37,000	Indonesia	0.12%
PNG	6,187,591	Sweden	21,000	Philippines	0.12%
Singapore	4,740,737	New Zealand	10,000	India	0.11%
New Zealand	4,290,347	PNG	3,000	PNG	0.05%

Source: International Institute for Strategic Studies: *The Military Balance*, 2011. CIA Factbook.

Our permanent armed forces in 2011 amounted to around 59,000, which puts us near the bottom of the table in our selection of countries. Overall, there are around 61 countries with armed forces numerically superior to ours. As a proportion of population, we have around one-quarter of one percent of our population engaged as full-time military personnel. This is less than European nations Germany (0.31%) and France (0.37%), and behind the United States (0.50%). In fact, in our selection, the only Western countries we comfortably beat are those well-known strategic optimists, Canada and New Zealand (both of which have their strategic approaches covered by more powerful neighbours) and Sweden which makes extensive use of reserve personnel. In regional terms, we fall well behind Singapore (1.54%), Malaysia (0.38%) and Thailand (0.46%) but ahead of Japan (0.20%), China (0.17%), Indonesia (0.12%) and the Philippines (0.12%).

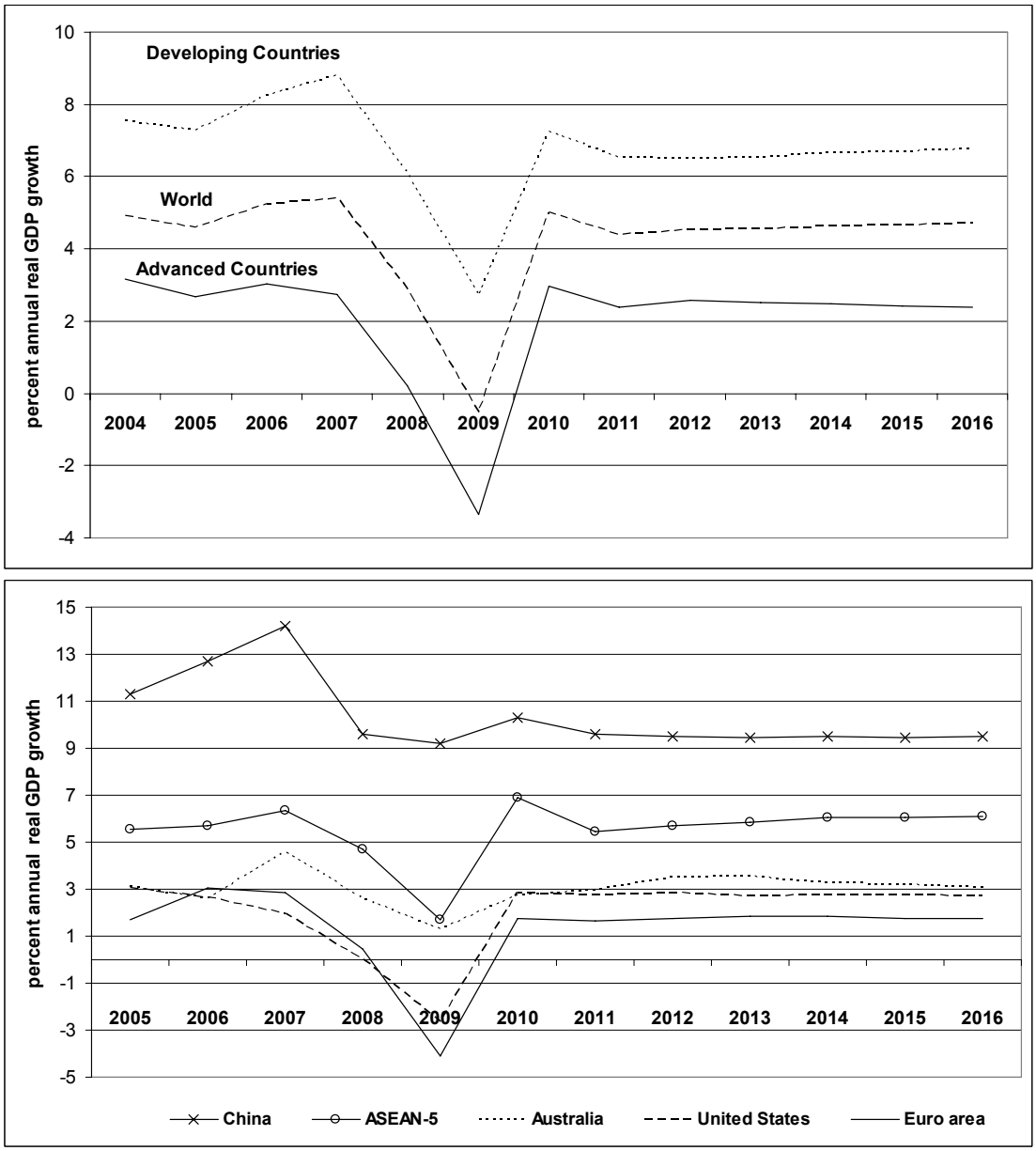
Australia's relatively modest ranking in terms of proportion of population needs to be seen in the context of our avowed 'maritime strategy'. With the exception of a short period in the 1960s which saw conscription boost the Army to over 40,000, Australia has never maintained a large peacetime standing Army. As a country with no land borders and no prospective adversaries with an amphibious capability, the imperative to develop a manpower-intensive land force is slight.

Impact of the Global Financial Crisis

In 2009, the ASPI Budget Brief devoted an entire chapter to the potential impact of the GFC. The key aspects of that analysis are updated below. Figure 5.24 shows the recorded and prospective economic contraction globally and for advanced and developing economies separately. As can be seen, the impact was more severe in the former. In fact, compared with the initial estimates from early 2009, developing countries have gotten off even more lightly than expected—typically 2-3% less contraction—thereby widening the gap between the impact on developed and developing counties.

The results for specific countries and sub-regions are shown in the lower graph. Note that China and Australia managed to avoid the worst of the recession compared with our respective cohorts.

Figure 5.24: The Great Recession

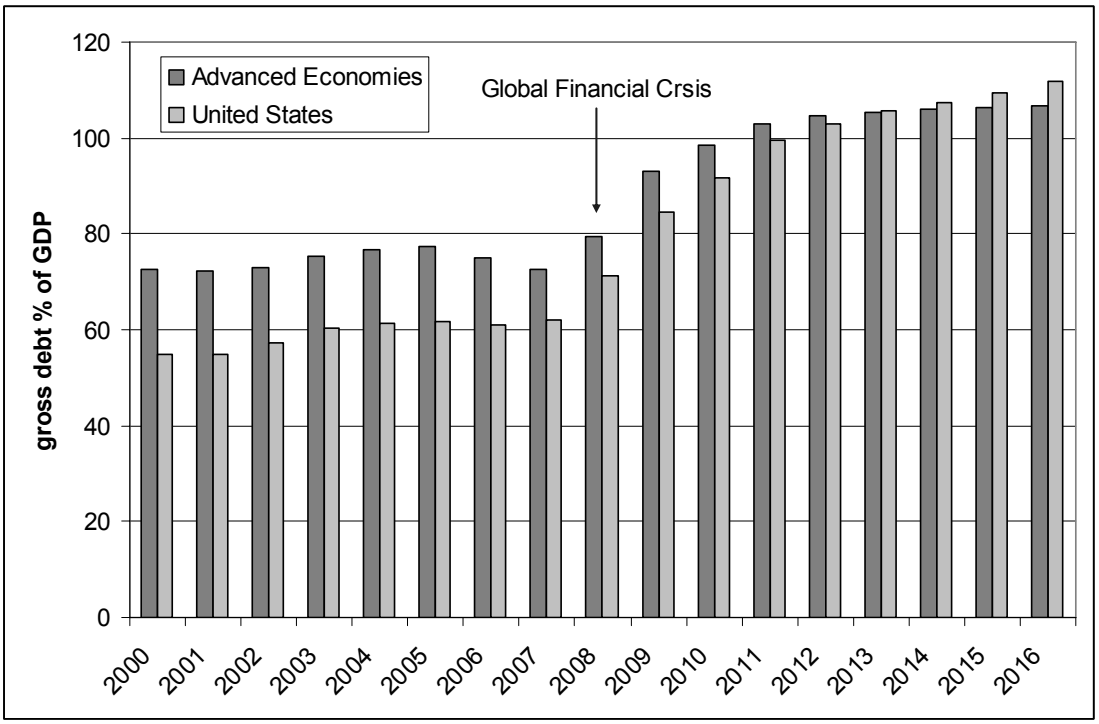


Source: International Monetary Fund, *World Economic Outlook*, April 2011.

At the time, the GFC only had a limited impact on international defence spending—probably because insufficient time was available to make substantial adjustments. Two years later, and the longer-term consequences are beginning to emerge. As shown earlier, from around 2010 substantial cuts have been recorded made in a number of countries.

From the perspective of defence spending (and government spending more generally, the GFC did two things. First, it rapidly exacerbated long-standing problems with government debt in many advanced economies, Figure 5.25.

Figure 5.25: The GFC and government debt



Source: IMF World Economic Outlook, April 2011.

Second, the GFC removed the complacency surrounding the sustainability of the financial system in general and government finances in particular. No longer is it possible to pretend that advanced economies can live beyond their means for ever. Moreover, the GFC forced many countries to face up to the fiscal dilemma caused by ageing populations. A 2010 study by the IMF projects that, on current policy settings, the average general government net debt among G-7 countries will reach 200% by 2030 and 441% by 2050.

The extent to which a country decides to reduce its defence spending as a result of mounting debt will depend on many factors—economic, strategic and cultural. A proper analysis of how these factors might come together for even one country is beyond the scope of this brief. But as we've already seen, a number of advanced economies are already working towards fiscal consolidation, including through cuts to defence spending.

As a guide to the extent of fiscal pressures, key economic and fiscal data for countries of interest has been collected in Table 5.6. France, Germany, Italy, the United Kingdom and the United States all face sizable growing debts. And while the United

States used to be a possible exception when it came to fiscal pressure because it owns the world's reserve currency, the devaluation of the US dollar is eroding that comfort.

As the data makes clear, there will be much more pressure on advanced economies to rein in defence spending than on developing ones. Among the advanced countries, Australia is in a relatively strong position given its low debt and relatively shallow downturn.

It is worth noting that the debt held by advanced economies will be more difficult to pay off than that in developing countries. Not just because advanced economies tend to owe a greater share of GDP, but also because developing economies grow two or three times faster than their advanced counterparts. Japan, in particular, faces an increasingly serious situation where its ageing population will impede growth at the same time as aged care and health costs rise in the years ahead. China, on the other hand, could erase its public debt within several years if it chose to do so.

References and sources

Economic data including GDP, deflators and CPI indices comes taken from the International Monetary Fund's *World Economic Outlook Database 2011* (April2010) available at www.imf.org. Most of the defence spending data is taken from successive editions of the International Institute of Strategic Studies' *Military Balance* from 1980 to 2011. Additional data has been drawn from the Department of Defence's *Defence Economic Trends* produced by the Defence Intelligence Organisation between 2000 and 2007. *Defence Economic Trends* is available at http://www.defence.gov.au/dio/product.html. Additional national defence spending data has been taken from: *Analysis of the FY 2011 Defense Budget Request*, 2011, from the Center for Strategic and Budgetary Analysis available at www.csbaonline.org; *China's National Defense in 2008*, the Defense White Paper for the People's Republic of China, available at http://china.org.cn/e-white/index.htm; *Historical Statistics of Japan;* The Statistical Bureau of the Ministry of Internal Affairs and Communications, Japan, http://www.stat.go.jp/english/data/chouki/index.htm. The IMF study referred to is 'Long-term Trends in Public Finances in the G-7 Economies', Carlo Cottarelli and Andrea Schaechter, SPN/10/13, 2010.

Table 5.6: Pressures on government spending that might curtail defence spending

	Fiscal balance 2011	Percentage annual GDP growth			Net government debt (IMF) or Public debt (CIA) as a share of annual GDP		
		2007	2009	2012	2005	2010 or 2011	2016
Advanced economies							
Australia	-1.5%	3.7%	1.8%	3.75%	3.8%	5.9%	~5%
Canada	-3.6%	2.2%	-2.5%	2.6%	31%	35%	33%
France	-4.0%	2.3%	-2.5%	1.8%	57%	78%	79%
Germany	-2.1%	2.8%	-4.7%	2.1%	53%	55%	53%
Italy	-2.8%	1.5%	-3.9%	1.3%	89%	101%	99%
Japan	-8.3%	2.4%	-6.3%	2.1%	85%	128%	164%
Korea	2.5%	3.9%	0.2%	4.2%	26%	28%	19%
Netherlands	-3.2%	3.9%	-3.9%	1.5%	26%	30%	34%
New Zealand	-3.8%	2.8%	-2.1%	4.1%	6%	10%	12%
Singapore	1.8%	8.8%	-0.8%	4.4%	102%	102%	-
Spain	-4.7%	3.6%	-3.7%	1.6%	34%	52%	65%
Taiwan	1.1%	5.1%	-1.9%	5.2%	32%	34%	-
United Kingdom	-6.6%	2.7%	-4.9%	2.3%	38%	75%	73%
United States	-8.1%	3.0%	-2.6%	2.9%	43%	72%	86%
Regional economies							
Indonesia	-1.5%	6.3%	4.6%	6.5%	56%	26%	-
Malaysia	-5.6%	6.5%	-1.70%	5.2%	45%	53%	-
Philippines	-	7.1%	1%	5.0%	74%	57%	-
Thailand	-2.4%	5.0%	-2.30%	4.5%	48%	42%	-
Vietnam	-	8.2%	5.3%	6.8%	66%	57%	-
Emerging powers							
China	-1.8%	14.2%	9.2%	9.5%	31%	17%	-
India	-8.8%	9.9%	6.8%	7.8%	60%	56%	-
Russia	-0.6%	8.5%	-7.8%	4.5%	28%	10%	-

Source: Australian Government Treasury Paper 1 2011-12, International Monetary Fund *World Economic Outlook,* April 2011, *CIA Factbook* 2011 and various media.

CHAPTER 6 – THE COST OF WAR

Introduction

The 2003-04 ASPI Budget Brief included a full analysis of the cost of all deployments since 1999-2000. Since then, rather than repeat that extensive discussion, we've maintained a shorter format. This chapter includes an explanation of how Defence is funded for deployments, updated tables of historical deployment costs, a summary of the cost of the Iraq, Afghanistan and other recent operations, and an assessment of the impact on peacetime rates-of-effort of recent operations.

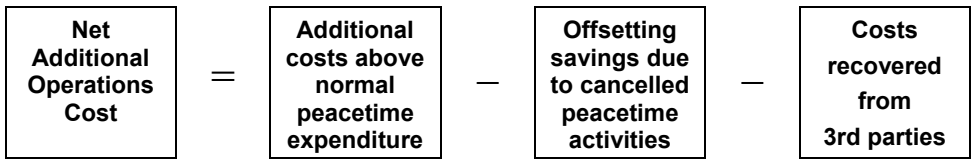
What do we mean by the cost of a war?

As a rule, Defence is supplemented for the *net additional* cost of any major military operation. This makes good sense because, in principle at least, it ensures that Defence does not have to compromise peacetime training to fund operations, and avoids them having to maintain a contingency reserve to cover unanticipated costs. This practice was suspended in 2008-09 because of a surplus of funding. It was then reinstated in 2009-10 but has only been applied partially since then.

Figure 6.1 shows how the net additional cost of an operation is calculated. In the past, Defence only disclosed the aggregate net additional operations cost, the total value of new capital investment and the amount recovered from 3rd parties. However, although offsets remain undisclosed, Defence sometimes provides itemised lists of the individual costs incurred in operations.

Figure 6.1 Calculating the 'Net Additional Cost of War'

Where:



The net additional operations cost includes the additional cost of personnel allowances, shipping and travel, repair and maintenance, health and inoculations, ammunition, contracted support, fuel, inventory, consumables etc. Offsetting savings include the money saved from foregone activities like the cancelled Exercise Crocodile 99 and the Avalon Air Show in 1999-00 due to the deployment of Australian Forces to East Timor. Those costs recovered from 3rd parties include the partial recouping of costs from the UN when participating in a UN peacekeeping operation.

The net additional capital investment usually represents the accelerated filling of capability gaps specific to the operation. Recent examples include the purchase of

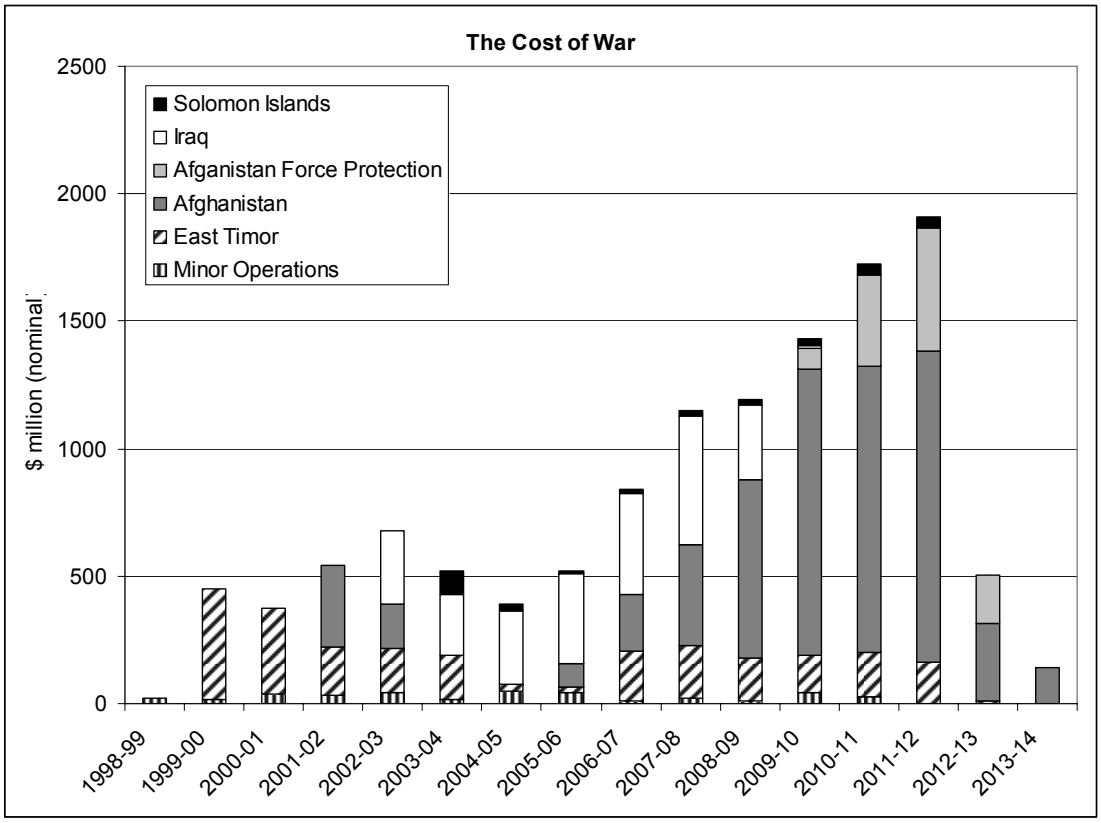
additional electronic warfare self-protection (EWSP) equipment for the AP-3C maritime patrol aircraft for Iraq, and the rapid acquisition of the *Javelin* anti-armour missile for Afghanistan. Capital costs sometimes also include modifications to platforms and additional inventory purchases.

Finally, it's worth being specific about what is not included. The net additional cost of an operation does not include pay and allowances that would normally be incurred, or the cost of operating platforms within the planned peacetime rate of effort. Nor does it cover the costs incurred outside of Defence by the Australian Federal Police, DFAT or others involved in operations. Thus, aside from additional items like new equipment, ammunition, transport and contracted services, the net additional cost is the *marginal cost* of increased ADF activity due to an operation.

What's the big picture?

Figure 6.2 shows the net cost of Defence deployments from 1998-99 to 2014-15. Note that Defence had been directed to absorb costs of $22 million in 2007-08, $1,082 million in 2008-09, $43.1million in 2009-10, $271 million in 2010-11, $368 million in 2011-12 and $193 million in 2012-13.

Figure 6.2: The net additional cost of ADF operations



Source: Defence Annual Reports and Budget Papers

Minor operations include Bougainville, which cost $109 million between 1998 and 2003 (of which $43.3 million was absorbed by Defence); Border Protection, which will incur costs of $149 million between 2001 and 2011; and the 2006 Commonwealth Games ($13 million).

Figure 6.2 excludes the 'force generation' costs nominally associated with expanding the ADF by 3,555 troops for East Timor in late 1999. This was roughly $450 million per annum permanently included into the Defence funding base at the time of the 2000 White Paper. In the figure, 'Afghanistan' includes the Multinational Interception Force (MNIF) which became part of the Iraq operation in March 2003 as well as the cost of enhanced force protection measures in the 2010-11 budget.

As shown in Figure 6.2, the cost of operations has grown for the sixth year in a row despite the draw-down of Australian troops in Iraq. The additional cost of enhanced force protection accounts for this.

New money for operations in the 2011-12 Budget

The PBS explains the additional supplementation that has been provided to cover the net additional cost of operational deployments [PBS pages 32 to 33]. Note that the duration of the spending should not be taken as implying anything final about the likely length of deployment; operations are reviewed at least annually and new funding is added in each budget. Also additional money is often provided post-deployment for repatriation and reconstitution of equipment.

Afghanistan
The government has funded the ADF deployment to Afghanistan until June 2012 at a cost of $1.7 billion for 2011-12, including $482 million for enhanced force protection measures. The total cost of operations in Afghanistan now stands at $7.0 billion since 2001.

East Timor
The government has extended the ADF deployment to East Timor until June 2012 and has provided $160 million in 2011-12 for that purpose. The total cost of operations in East Timor now stands at $4.3 billion including 'force generation' supplementation since 1999.

Solomon Islands
The government has extended the ADF deployment to Solomon Islands until June 2012 and provided $43.5million over one year for that purpose (including previous funding). The total cost of operations in Solomon Islands now stands at $313 million.

Impact of operations on peacetime rates of effort

The impact of deployments on planned peacetime rates of effort is often counter-intuitive because rates-of-effort sometimes fall due to disruption caused. For example, despite getting $14 million for increased AP-3C operating costs due to the Iraq deployment during 2002-03, the fleet fell short of its planned rate of effort by 15% in that year. Table 6.1 lists the rate of effort for key platforms employed in recent operations. Unfortunately, figures are not available for Navy vessels, although anecdotal evidence is that they regularly deliver substantial numbers of steaming days in support of operations, well above peacetime rates-of-effort. In 2008-09 the rate of effort for deployed platforms once again tended to fall below the budgeted level. Note that Defence has not requested supplementation for additional flying hours in recent operations.

Table 6.1: Impact of deployments on flying hour rates (Defence Annual Reports)

Platform	*Budgeted peacetime rate of effort*	*Actual*	*% Difference*
1999-00 (period including East Timor INTERFET operation)			
Black Hawk	9,260	8,179	-11.67%
Kiowa	8,985	8,379	-6.74%
C-130	16,762	13,144	-21.58%
Caribou	5,080	4,356	-14.25%
2001-02 (period including War on Terror & Border Protection operations)			
C-130	14,000	13,102	-6.4%
F/A-18	13,000	11,287	-13.2%
P-3C	8,660	9,624	+11.1%
2002-03 (period including Iraq war)			
C-130	14,000	13,622	-2.7%
F/A-18	12,500	14,077	+12.6%
AP-3C	9,600	8,172	-14.9%
Chinook	1,270	1,364	7.4%
2003-04 (period including Iraq, East Timor and Solomon Islands)			
C-130	15,000	13,992	-6.7%
F/A-18	12,500	12,820	2.6%
AP-3C	9,100	7,702	-15.4%
Chinook	1,270	876	-31.0%
Black Hawk	8,600	6,864	-20.2%
Kiowa	12,970	11,425	-11.9%
2004-05 (period including Iraq and Solomon Islands)			
C-130	16,000	13,502	-16.0%
AP-3C	8,2000	8,431	3.0%
DHC-4	5,080	3,038	-40.0%
2005-06 (period including Afghanistan, Iraq, East Timor and Solomon Islands)			
Chinook	1,270	1,091	-4.1%
Black Hawk	8,600	6,918	-19.5%
AP-3C	8,200	7,418	-5%
C-130	15,000	13,149	-12.3%
2006-07 (period including Afghanistan, Iraq, East Timor and Solomon Islands)			
Chinook	1,270	1,168	-8.0%
Black Hawk	7,500	6,157	-17.9%
AP-3C	8,200	7,094	-13.5%
C-130	10,000	10,182	1.8%
2007-08 (period including Afghanistan, East Timor and Solomon Islands)			
Chinook	1,270	1,143	-10%
Black Hawk	7,500	6,348	-15%
AP-3C	8,200	7,533	-8%
C-130	9,200	10,235	+11%
2008-09 (period including Afghanistan, East Timor and Solomon Islands)			
Chinook	1,270	1,388	+ 9%
Black Hawk	7,500	7,175	- 4%
AP-3C	7,900	8,003	+1%
C-130	10,900	10,585	- 3%
2009-10 (period including Afghanistan, East Timor and Solomon Islands)			
Chinook	1,570	1,563	- 0.4%
Black Hawk	8,600	8,134	- 5%
AP-3C	7,900	7,687	- 3%
C-130	10,550	9,808	- 7%
C-17	4,000	3,382	- 15%

CURRENT OPERATIONS AT A GLANCE

Figure 6.3: Afghanistan

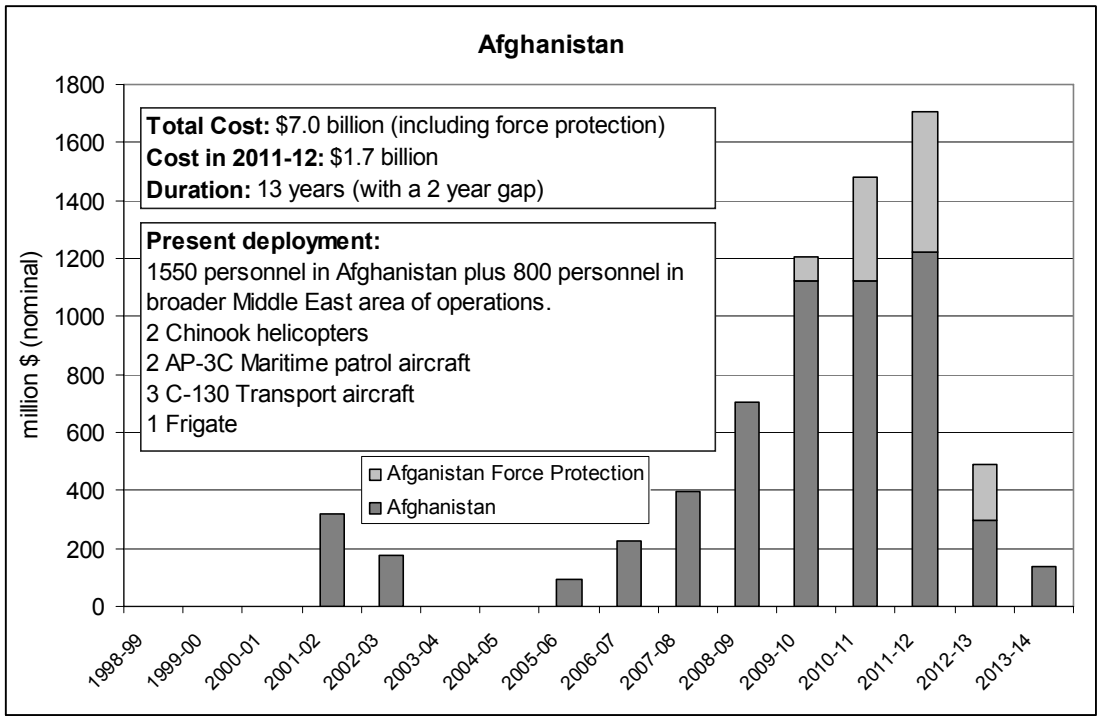
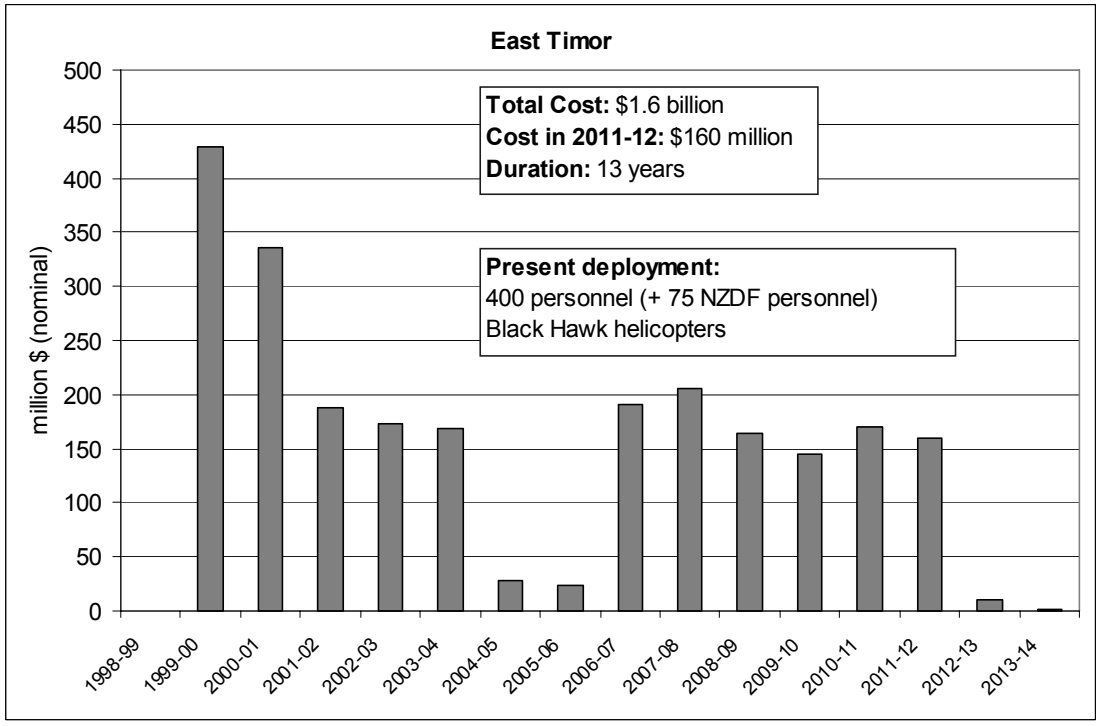


Figure 6.4: East Timor



Note: Force Generation funding to temporarily expand the Army and Air Force (which did not occur) is not included.

Figure 6.5: Solomon Islands

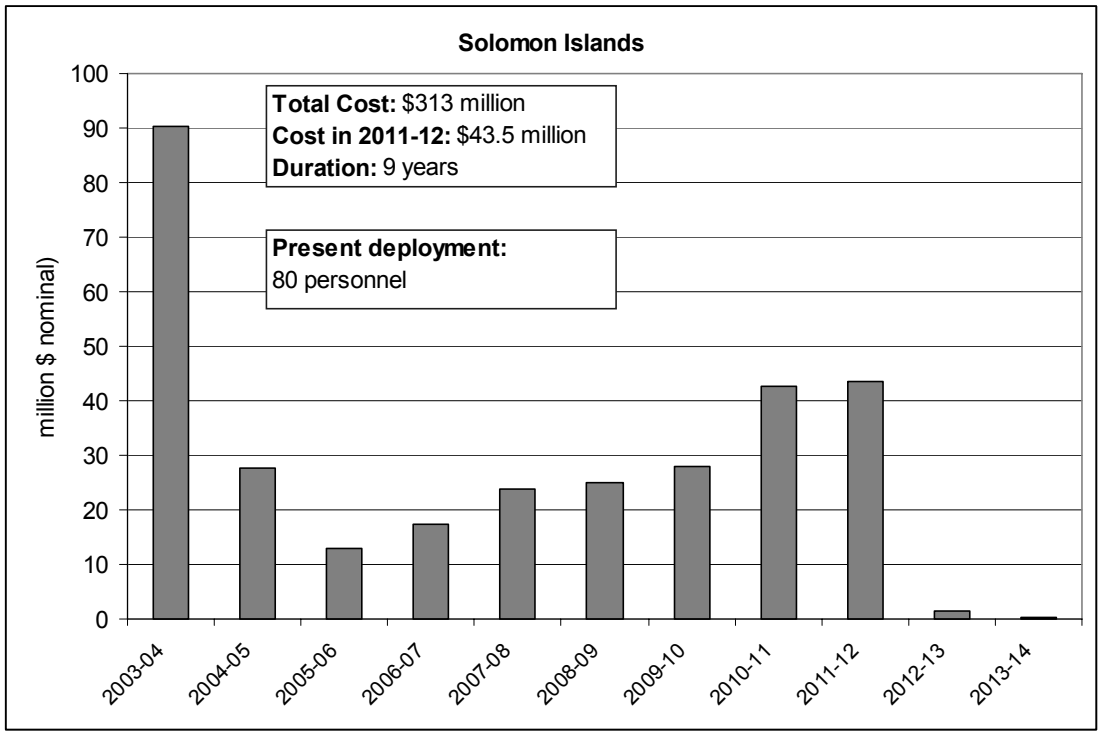
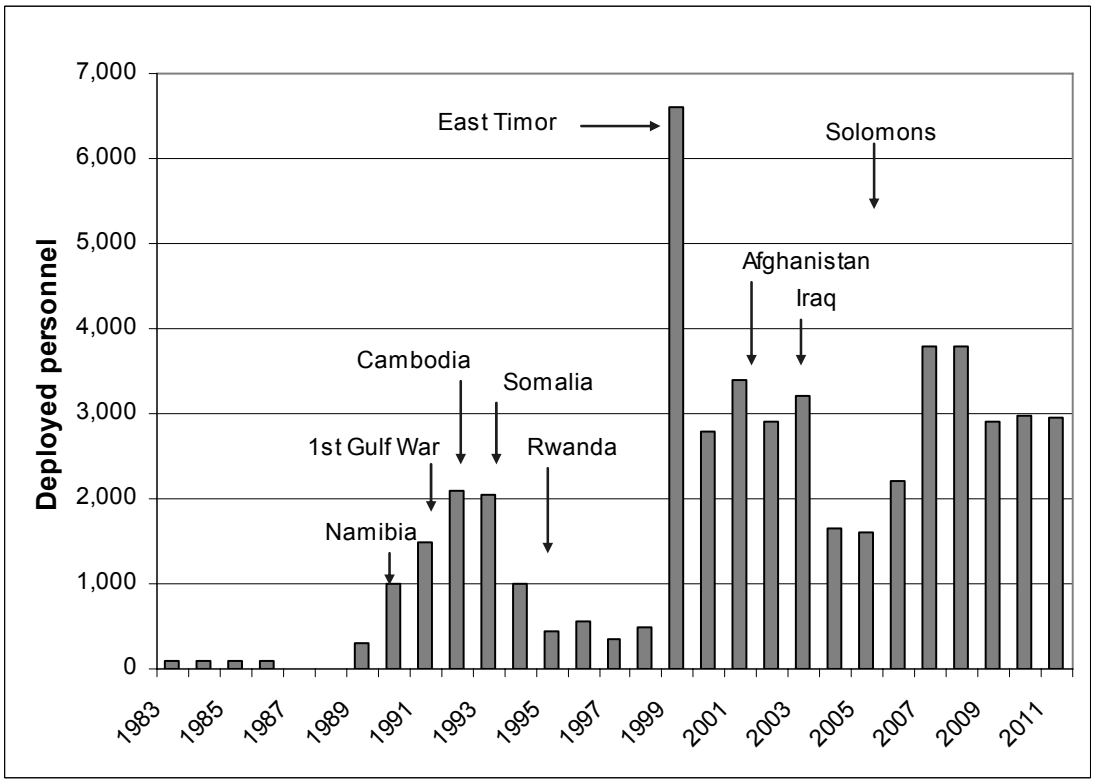


Figure 6.6: Indicative deployed personnel numbers, circa May each year.



Note: numbers do not include ~400 personnel on border protection duty

CHAPTER 7 – MILITARY BURDEN SHARING AND AUSTRALIA

As debates go; there was not much to it. Apart from a few dissenting voices, the Parliamentary debate on our military involvement in Afghanistan saw a long procession of politicians agreeing with one another. Not only was there unqualified support for the troops in the field, but there was broad political agreement on why we are there. Fighting in Afghanistan, we were told, is in our national interest.

On the question of how large a commitment we should be making, there was only a wisp of difference. Although the Opposition Leader said that his 'instinct would be to do more rather than less' he 'accepted that this is necessarily the government's call'. To the extent that there's a difference of opinion on how much we should be doing, it's barely on the parliamentary agenda.

But the question remains; how large an effort should Australia be putting into Afghanistan? Public opinion is in favour of withdrawal, yet it's been argued that we should be doing more—either to bolster our alliance with the United States or to increase the likelihood of overall success. (It's worth being clear that this is separate and distinct from the question of how many troops are needed to safely accomplish our current mission. Although this has been a matter of heated dispute, it is beyond the scope of what's explored here.)

The remainder of the chapter seeks to understand why our commitment to Afghanistan is the size it is. Readers wanting a nuanced discussion of shared values and strategic culture should read no further. What follows is a dry examination of the economics (for the want of a better word) of Australia's military contribution to the international effort in Afghanistan. What this admittedly narrow perspective lacks in scope, it makes up for with 12 pages of supporting data.

Why are we there?

Any sensible discussion of how much we should be doing in Afghanistan should be based on what we seek to achieve there. According to the Prime Minister;

> *Australia has two vital national interests in Afghanistan.*
>
> *One: to make sure that Afghanistan never again becomes a safe haven for terrorists, a place where attacks on us and our allies begin.*
>
> *Two: to stand firmly by our Alliance commitment to the United States, formally invoked following the attacks on New York and Washington in 2001.*

The relative importance of these factors has been debated repeatedly over the past decade. For our purpose, it is enough to take them at face value with no assumption about relative importance. Nevertheless, it's important to recognise that the two factors are intrinsically different. The first seeks to influence the political situation in Central Asia for the collective *public good*. The second seeks to maintain the strength of an alliance for our *private good*. Even though whatever we do in pursuit of one in

Afghanistan contributes to the other, the distinction between private and public or collective goods is important.

Once provided, public goods are available to everyone to enjoy (they are non-excludable) and their consumption does not reduce the amount available to others (they are non-rivalrous). If al-Qaeda is denied a base in Afghanistan, we will receive the benefit come what may. Private goods, on the other hand, are excludable and often rivalrous. In the case of our alliance with the United States, it is excludable—ask New Zealand—and at least partially rivalrous since US military resources are finite. Because alliances and coalitions (the distinction is not important here) are at the heart of our interests and actions in Afghanistan, we turn now to examine them.

The economics of alliances

In principle, alliances are straightforward arrangements. During times of peace, states enter into alliances to strengthen their position against potential adversaries, often, but not always, with deterrence in mind. During war, states combine their resources to defeat their enemies. If only things were that simple.

Alliances are messy affairs in practice. To start with, alliance members often have different and sometimes even conflicting goals. These differences can lead to bargaining behaviour that depends sensitively on the specific circumstances. Very little that can be usefully said is generically true; entire books have been written on the machinations surrounding the allied summits at Yalta and Potsdam in the closing days of WWII.

More relevant in the present context, and more generic in its consequences, is that alliance members generally have different imperatives and capacities to contribute to the common effort. Economists who study the behaviour of groups[1] predict that when this happens:

- alliances will collectively devote fewer resources than would be optimal given the expected benefits

- the ‘larger’ members of the alliance will carry a disproportionate share of the costs

On the second point, the term ‘larger’ is shorthand for a combination of capacity and motivation exceeding that of most of the other members of the alliance. As far as Australia is concerned, the larger member is the United States. The underlying economic theory comes with several qualifications and some special cases that need not concern us, except to note that the all-out effort by allies in WWI and WWII is fully explained; if the stakes are absolute, so too is the effort of all alliance members. In economic terms, in those circumstances defence becomes a *superior good*.

NATO has long been used as a case study by economists interested in burden sharing within alliances, and throughout the Cold War it provided clear confirmation of each of the predictions. Fewer resources were devoted than necessary; at no point did NATO ever have the forces that they themselves judged necessary to defeat the Soviets in a conventional conflict in Europe. At the same time, the relative contributions of members to the common defence were disproportionately carried by

the larger states and in particular the United States—a trend that continues to the present as shown in Table 7.1. Similar trends can be observed among the United States' Asian allies, including Australia.

Table 7.1: NATO and US ally defence spending as a share of GNP/GDP 1965 to 2009

	1965	1970	1975	1980	1985	1990	1995	2000	2005	2009
United States	8.0	7.8	6.0	5.6	6.7	5.7	4.0	3.0	4.0	4.7
United Kingdom	6.3	4.9	5.0	4.7	5.3	4.0	3.0	2.5	2.3	2.7
France	5.6	4.0	3.8	4.1	4.1	3.6	3.1	2.6	2.5	2.1
Germany	4.4	3.3	3.5	3.3	3.1	2.8	1.7	1.5	1.4	1.4
NATO Europe	-	3.6	3.7	3.7	3.8	3.0	2.3	2.1	1.8	1.7
Japan	1.3	0.8	0.9	0.9	1.0	1.0	1.1	1.0	1.0	1.0
South Korea	3.8	4.0	5.1	5.7	5.1	4.4	3.4	2.7	2.6	2.7
Australia	3.3	2.9	2.2	2.3	2.50	2.1	2.0	1.8	2.0	1.9

Source: ASPI defence spending, The Military Balance IISS various years and official NATO reporting

The tendency of smaller countries to contribute proportionately less to the common effort is often termed 'free-riding'. It should come as no surprise. The smaller members of an alliance face a simple logic. If they increase the size of their contribution, their costs increase with little prospect of making any difference to the overall balance of power in peacetime or outcome in wartime. Where the benefits are more graduated (e.g. curtailing piracy on the high seas), the smaller members of the alliance face a situation where greater effort is rewarded by only a fraction of the greater public good so created. They incur the full additional cost but have to share the additional benefit. In each case, the motivation to contribute is lessened.

So why do alliances work at all? Apart from the extreme case of when defence becomes a superior good, why does anyone other than the larger members ever bother to contribute to the public good of collective defence? At least three factors are at play.

First, there are ideological and cultural factors that predispose countries to work together. Although political leaders and commentators tend to emphasize this point, it is difficult to judge how important it really is. The Anglosphere of the United States, Great Britain and Australia that emerged at the time of the invasion of Iraq was arguably driven, at least in part, by cultural affinity and a common worldview. Conversely, the unsentimental haste with which Australia switched its focus from Great Britain to the United States after WWII was a triumph of realism over historical ties.

Second, some countries derive a private benefit from the act of contributing to military coalitions. Consider, for example, the breathless jingoism that accompanied the dispatch of Australian troops to the Boer War in 1900 and then again in 1914. Even today, Australian society takes vicarious pride in the exploits of the defence force. More so than most other countries, our national identity is closely linked to our military history.

Third, and by far most important, alliances work because the smaller members are induced to contribute to the public good in exchange for private goods. The essential point is that to be successful, an alliance must offer smaller members not just the prospect of greater public goods—which they can get for free—but also private goods from which they can be excluded.

The need for an alliance to offer private goods to its members is commonplace. Take the examples of trade unions and industry lobby groups. They both exist to deliver largely non-excludable benefits and therefore both face the problem of free-riding. And they both offer private goods to their members as a remedy. In the case of trade unions, the inducements can range from discounted movie tickets to legal assistance. Lobby groups, on the other hand, use strategies such as providing their members commercial intelligence and arranging access to government officials.

The 'larger' members of alliances offer the lesser members a range of ancillary benefits, including everything from diplomatic fawning to 'special' access to military technology and intelligence. More importantly, they offer the prospect of military assistance in circumstances beyond where common interests exist. Although alliances are almost always predicated on the pursuit of common goals (public goods), they are often held together by the prospect of a *quid pro quo* in circumstances where the goals of members diverge (private goods). For example, while Australia can reasonably expect that the United States will continue to play a power-balancing role in North Asia *vis-a-vis* China to protect its own interests, we have little assurance that they would side with us in a disagreement with, say, Indonesia or Malaysia. For better or worse, the 'common good' in an alliance is set by the interests of the larger members.

But because the larger members of an alliance are in a poor bargaining position, even this is not enough to eliminate free-riding. From their point of view, it is almost always better to have a free-riding ally than no ally at all. As a result, they are much more likely to confer inducements than to threaten punishment when seeking others to share the burden.

Even if the larger members of an alliance threatened to withhold future alliance benefits from free-riders, the smaller members would then only be encouraged to ensure that their free-riding was no more egregious that that of others similarly placed. While it might make sense for an alliance to have an exemplary sacrifice of one or two smaller members, it would not cast itself asunder to make a point.

If the preceding analysis is correct, we would expect to see the United States carrying a disproportionate share of the burden in coalition operations and for the lesser members to make relatively smaller but broadly commensurate contributions—with those more reliant on the United States for their unilateral security doing the most.

To test this, a statistical analysis of contributions to the recent US-led missions to Iraq and Afghanistan has been undertaken, the results of which appear at the end of this chapter. There are no surprises. Consistent with the long established post WWII patterns in defence spending, US allies and coalition partners have free-ridden on the efforts of the United States in Iraq and Afghanistan. Note that the scale of Australia's efforts compares favourably with that of other close US allies. This and other aspects of Australia's alliance with the United States are explored in the next section.

Australian burden sharing and the US alliance

The size of Australia's contribution to coalition operations is often justified on the basis of the capacity of the ADF. This might have been plausible in 2001 or 2002, but almost a decade later it is not. When a country that enlisted 400,000 troops for WWI from a population of less than 5 million only musters 1,550 from a population of almost 22 million, it is a matter of choice, not capacity. Had we wished to carry a greater share of the burden we would have followed the United States and mobilized our reserves and expanded the permanent force. Nor has there been any economic constraint on making a larger contribution since, by the standards of the developed world, Australia is in an uncommonly strong economic and fiscal position.

Nor, according to the government's own assessment, are our interests any less engaged than those of the United States. And they have a point. Since 2001, Australian authorities have disrupted terrorist plots on no less than four occasions, and Australians have been repeatedly targeted in attacks in Indonesia, including the Bali bombings of 2002 and 2005, the attack on the Australian Embassy in 2004 and the Marriot hotel bombing of 2009.

Irrespective of how important the outcome of the Afghanistan conflict will be to stemming these problems, we face precisely the sort of situation where economists would expect us to free-ride. Whatever common good derives from the conflict in Afghanistan will be available to us irrespective of what we do. So rather than punch above our weight, we've decided to run with the pack and make a modest contribution commensurate with others.

And there has never been any suggestion that we might be punished for our disproportionately small effort. Instead, the United States has chosen carrots over sticks. Consider what the United States has gifted Australia over the past decade. Our political leaders have been invited to the White House and showered with praise for our steadfast commitment. Prime Minister John Howard (a.k.a. the 'man of steel') even got a sleep-over at the President's ranch. Our senior military leaders have been rewarded with medals and prestigious appointments in US military headquarters—as if the United States has a shortage of generals. And then there are the official steps that have been taken. The US-Australia Free-Trade Agreement came into force in 2005 and was followed in 2007 by the US-Australia Treaty on Defence Trade Cooperation. Finally, in 2009, the United States and Australia agreed on principles to guide greater cooperation on intelligence, surveillance, and reconnaissance. So, just as economics predicts, as a smaller alliance member we've received private goods in recognition of our contribution to the collective good.

Thus, most signs point to Australia's recent contributions to US-led coalitions having been adequate to the task, narrowly defined as maintaining our standing in the alliance. That's not to say that there have not been grumblings. Apparently our very carefully circumscribed mission to Al Muthanna province in Southern Iraq won few accolades in US military circles. But it's the US polity rather than the US military that needs to be placated, and our more concerted efforts in Afghanistan since then have reportedly balanced the ledger anyway.

Finally, it must be remembered that governments fight wars at the sufferance of the electorate. And neither Iraq at any time, nor Afghanistan more recently, have been

popular conflicts in Australia. This is no doubt understood by the United States and is taken into account in gauging the scale of our contributions.

The extent of public disenchantment is worthy of examination. An *Essential Media* poll conducted in March this year reported that 56% of those polled said that Australia should withdraw its troops from Afghanistan—compared with 47% in October last year, Table 7.2. On this basis, Australia's commitment to Afghanistan is less popular today than the Vietnam conflict was at any time been 1965 and 1970, Table 7.3.

Table 7.2: Australian Public Opinion on Afghanistan 2009 to 2011

'Thinking about the Australian troops in Afghanistan, do you think Australia should –'

	Mar 2009	June 2010	Oct* 2010	Oct* 2010	Mar 2011
Increase the number of troops in Afghanistan	14%	7%	13%	10%	5%
Keep the same number of troops in Afghanistan	24%	24%	24%	30%	30%
Withdraw our troops from Afghanistan	50%	50%	49%	47%	56%
Don't know	12%	12%	14%	14%	9%

*The two October 2010 polls occurred before (11 October) and after (25 October) the Prime Minister's 19 October speech on Afghanistan. Source: Essential Media, Reference 2.

Table 7.3: Australian Public Opinion on Vietnam 1965 to 1970

'Do you think we should continue to fight in Vietnam or bring our forces back to Australia?'

	Sept 1965	Sept 1966	May 1967	Oct 1968	Dec 1968	April 1969	Aug 1969	Oct 1969	Oct 1970	Oct 1970
Continue	56%	61%	62%	54%	49%	48%	40%	39%	43%	42%
Bring back	28%	27%	24%	38%	37%	40%*	55%	51%	45%	50%*
Undecided	16%	13%	14%	8%	14%	12%	6%	10%	12%	9%

Source: Morgan Gallop Poll adapted from Groot and Tiffen, Reference 3. * 'bring back now'

Of course, while the two surveys probably give an accurate reflection of the *direction* of public opinion, it would be a mistake to conclude that the *depth* of sentiment was the same in each case. Vietnam was a highly emotional and divisive issue in Australia whereas Afghanistan is not. This arguably goes beyond bipartisan political support for Afghanistan—it's more a case of Afghanistan simply not being a 'big issue'.

One of the more interesting aspects of the recent Afghanistan polling is the very limited support for sending more troops. For every six people who wanted to 'stay the course' there was only one who wanted to send more troops. Perhaps this reflects the argument put forward by Defence that they have 'exactly the right number of troops' to complete the mission (who knew the military arts were so precise). More likely, it reflects an assessment—accurate as it happens—that sending more troops would increase our costs for no benefit.

Statistical analysis of burden sharing; Iraq and Afghanistan

Invasion of Iraq 2003

Only four countries participated in the US-led invasion of Iraq in 2003, see Table 7.4. In terms of available military capacity, the United Kingdom's contribution represented two-thirds the effort of the United States. However, on a per-capita population basis, the United Kingdom contributed less than half as much because its military represents a smaller share of its population (0.3% verses 0.5%). Roughly speaking, Australia's contribution was around an order of magnitude smaller in terms of per-capita population and military size. Canada made a token contribution. The failure of other countries to participate in the invasion of Iraq reflected strong disagreements over the prudence and legality of the venture rather than free-riding.

Table 7.4: Invasion of Iraq

	Personnel deployed	Population	Military personnel	Deployed personnel per million population	Percentage of defence force deployed
United States	423,998	302,741,000	1,427,000	140	29.71%
United Kingdom	40,906	60,261,000	212,660	68	19.24%
Australia	2,050	19,727,476	53,650	10	3.82%
Canada	31	32,307,000	52,300	0.1	0.06%

Sources: Analysis of data from References 4, 5 and 6.

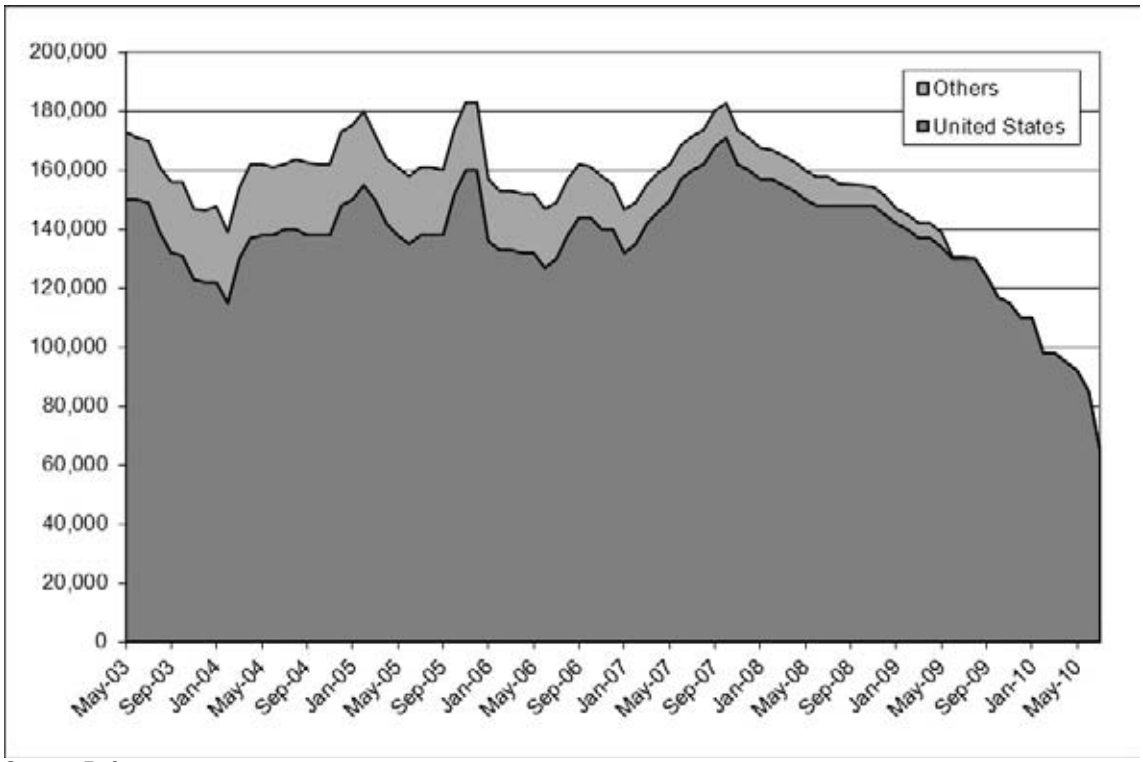
Iraq – Stabilisation 2003-2010

Following the initially successful invasion, more than 39 countries eventually contributed troops for stabilisation and reconstruction in Iraq. Figure 7.1 shows the size of US and other coalition forces in Iraq from 2003 to the present. Note that these figures do not include the substantial number of US forces deployed 'in-theatre' adjacent to Iraq or the very large number of private contractors employed by the United States in Iraq.

In terms of troop-years, the US military has expended almost ten times as much effort as all its coalition partners combined in Iraq; 995,133 versus 104,593 troop-years (data from Reference 7). Non-US coalition troop numbers reached a peak of 25,300 in January 2005. Numbers declined steadily thereafter, despite (or perhaps because of) the increased violence that arose around that time.

Although insufficient data is available to reconstruct a full time-series of all the separate contributions to the coalition, a snapshot from August 2005 is available, see Table 7.5. Once again, the numbers include only personnel in Iraq exclusive of contractors. Note that a number of major US allies are conspicuous by their absence, including Spain, France and Germany. Spain and the Netherlands made sizable early contributions but had departed by August 2005. Of the large Western European powers (*Old Europe*), only the United Kingdom and Italy had significant forces deployed to Iraq in August 2005. Equally noteworthy is the number of contributions from former Warsaw Pact countries (*New Europe*), in particular Poland, Ukraine, Georgia, Romania and Bulgaria. It might reasonably be concluded that they did so to bolster their new-found strategic relationship with the United States.

Figure 7.1: US and Coalition troop strength in Iraq 2003 to 2010



Source: Reference 7.

Table 7.5: Coalition personnel in Iraq August 2005

Country	Personnel	Country	Personnel
United States	138,000	Latvia	136
United Kingdom	9,200	Mongolia	130
South Korea	3,300	Lithuania	120
Italy	3,101	Albania	120
Poland	1,500	Slovakia	100
Ukraine	1,640	Czech Republic	90
Australia	1,400	Armenia	45
Romania	850	Bosnia & Herzegovina	36
Georgia	850	Macedonia	35
Japan	800	Estonia	40
Denmark	470	Kazakhstan	27
Bulgaria	466	Norway	10
El Salvador	380	Netherlands	4
Azerbaijan	151		

Source: reference 7, 9 and 10.

Some care needs to be taken in inferring burden-sharing from the personnel numbers in Table 7.5. Many countries had other significant operational demands of their armed forces at that time. Indeed, by August 2005 the non-US component of coalition forces in Afghanistan had risen to over 10,000 personnel. A fuller picture can be formed by taking account of other forces deployed by countries at the same time, including forces deployed in the vicinity of Iraq in support. This is done in Table 7.6 where data

for France, Germany, Spain, Canada and New Zealand has been included for comparison. Long-standing deployments and overseas stationing within existing alliances have been excluded from the figures along with extended naval deployments. For example, US forces in Germany, Japan and Korea are excluded. The goal has been to identify those forces engaged in *contingency operations* rather than permanent overseas basing. The distinction is sometimes difficult to make and some uncertainty therefore attends the precise figures.

Table 7.6: Selected international deployed forces as at August/September 2005

	Deployed Forces				Population (thousands)	Military	Deployed forces per million population	Percentage of defence force deployed
	Iraq	Afghanistan	Other	Total				
United States	192,600	19,500	3,058	215,158	302,741	1,473,960	711	14.60%
United Kingdom	9,200	315	2,792	12,307	60,261	205,890	204	5.98%
South Korea	3,300	206	38	3,544	47,566	687,700	75	0.52%
Italy	3,101	1,246	4,697	9,044	58,645	191,875	154	4.71%
Poland	1,500	110	1,459	3,069	38,198	141,500	80	2.17%
Ukraine	1,640	0	851	2,491	46,936	187,600	53	1.33%
Australia	1,200	550	452	2,202	20,395	52,872	108	4.16%
Georgia	850	0	140	990	4,465	11,320	222	8.75%
Romania	850	452	375	1,677	21,635	97,200	78	1.73%
Japan	800	0	30	830	127,449	239,900	7	0.35%
Denmark	470	266	443	1,179	5,417	21,180	218	5.57%
Bulgaria	466	34	9	509	7,739	51,000	66	1.00%
El Salvador	380	0	16	396	6,059	15,000	65	2.64%
Azerbaijan	151	22	34	207	8,453	66,490	24	0.31%
Mongolia	130	21	7	158	2,550	8,600	62	1.84%
Lithuania	120	6	127	253	3,416	13,510	74	1.87%
Czech Republic	110	56	511	677	10,195	22,272	66	3.04%
Slovakia	100	18	162	280	5,386	20,195	52	1.39%
Latvia	90	6	127	223	2,292	5,238	97	4.26%
Albania	70	81	73	224	3,111	21,500	72	1.04%
New Zealand	61	132	48	241	4,111	8,660	59	2.78%
Armenia	46	0	34	80	3,065	48,160	26	0.17%
Bosnia & Herzegovina	36	0	14	50	3,781	24,672	13	0.20%
Macedonia	35	48	0	83	2,035	10,890	41	0.76%
Estonia	40	20	3	63	1,347	4,934	47	1.28%
Kazakhstan	27	0	0	27	5,221	12,500	5	0.22%
Norway	12	147	209	368	4,635	25,800	79	1.43%
France	0	1,385	12,139	13,524	61,013	254,895	222	5.31%
Netherlands	6	153	1,002	1,161	16,316	53,130	71	2.19%
Germany	0	2,073	4,939	7,012	82,409	284,500	85	2.46%
Spain	0	702	1,946	2,648	43,060	147,255	61	1.80%
Canada	0	1,576	1,052	2,628	32,307	62,000	81	4.24%

Source: Analysis of data from References 5, 7, 9, 10 and 11.

The information in Table 7.6 is rendered graphically in Figures 7.2 and 7.3. Several points are worth noting. First, the United States carried a disproportionately large share of the operational burden especially on a per-capita population basis. Not only does the United States maintain a higher relative capacity for operations (as also reflected in its higher defence GDP share) but it is demonstrably more willing to use that capacity. Second, although France, Canada and Germany were not contributing to operations in Iraq in late 2005, they were maintaining significant efforts elsewhere (somewhat less so in the case of Germany). Similarly for Italy which divided its efforts between Iraq and Afghanistan.

Figure 7.2: Deployed forces as a percentage of permanent forces as at Aug/Sept 2005

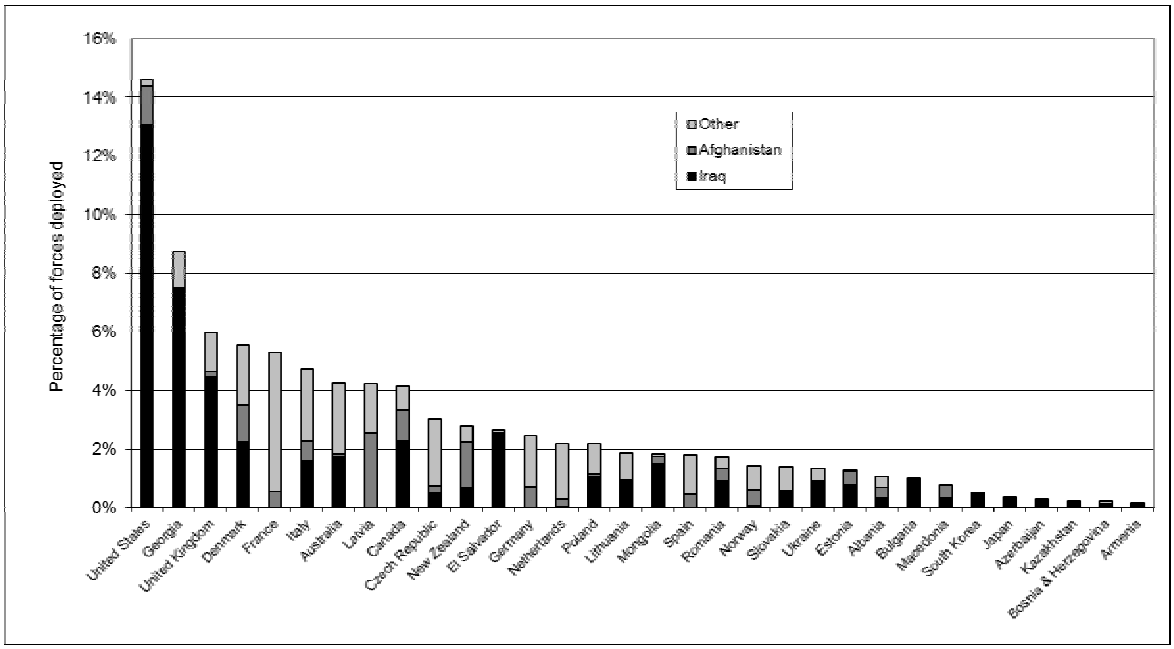
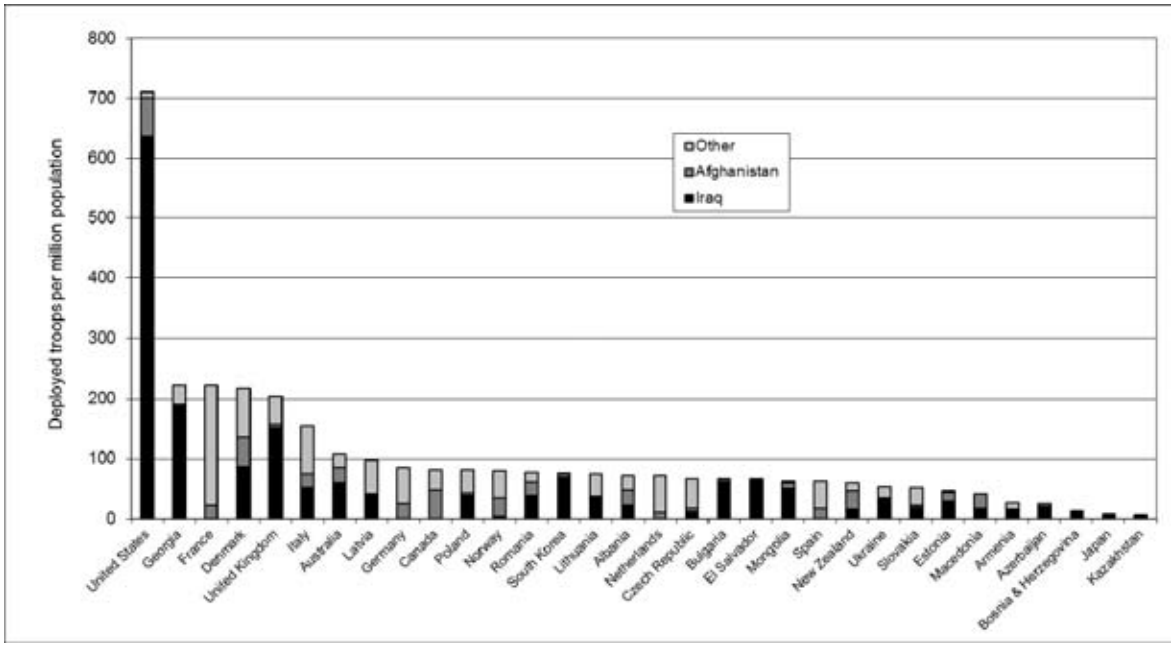


Figure 7.3: Deployed forces per million head of population as at Aug/Sept 2005



Third, apart from the impressive efforts of Georgia and Latvia, the military effort by *New Europe* was in general not greater than that of the United States' traditional allies from *Old Europe*. Fourth, the United Kingdom's effort was commensurate with that of France but focused overwhelmingly on supporting the United States. Fifth, Australia and New Zealand rank credibly alongside their European colleagues.

Iraq – Fatalities 2003-2010

Not all troop contributions are the same. Some countries contribute valuable assets like helicopters and combat aircraft while others provide soldiers of varying levels of expertise. Unfortunately, time and the unavailability of data prevented a detailed analysis along these lines.

However, contributions can also vary due to the level of risk that a country is willing to bear and it is possible to roughly gauge this aspect. Such concerns are usually reflected in explicit caveats or through the cautious geographical positioning of forces. One imperfect measure of such factors is the rate of fatalities per year per deployed person. By reconstructing a rough time-series of major coalition deployments in Iraq it is possible to calculate the number of troop-years of exposure and compare this with the total fatalities suffered. The results appear in Table 7.7 and Figure 7.4. Only troops physically deployed in Iraq have been counted in the estimate of troop-years (otherwise the US figure would be lower due to the large number of troops deployed outside of Iraq in support). It is important to remember that a large number of countries suffered no casualties.

Table 7.7: Fatalities per troop-year in Iraq 2003-2010

	Troop-years in Iraq	Killed	Fatalities per 1000 troops per year		Troop-years in Iraq	Killed	Fatalities per 1000 troops per year
United States	995,133	4416	4.4	Spain	1,300	11	8.5
Non-US Coalition	104,593	316	3.0	Denmark	2,053	7	3.4
United Kingdom	44,100	179	4.1	Georgia	3,604	4	1.1
Italy	9,400	33	3.5	Romania	4,230	3	0.7
Poland	8,575	23	2.7	Netherlands	2,445	2	0.8
Ukraine	4,050	18	4.4	Australia	3,968	2	0.5
Bulgaria	1,607	13	8.1	South Korea	9,530	1	0.1

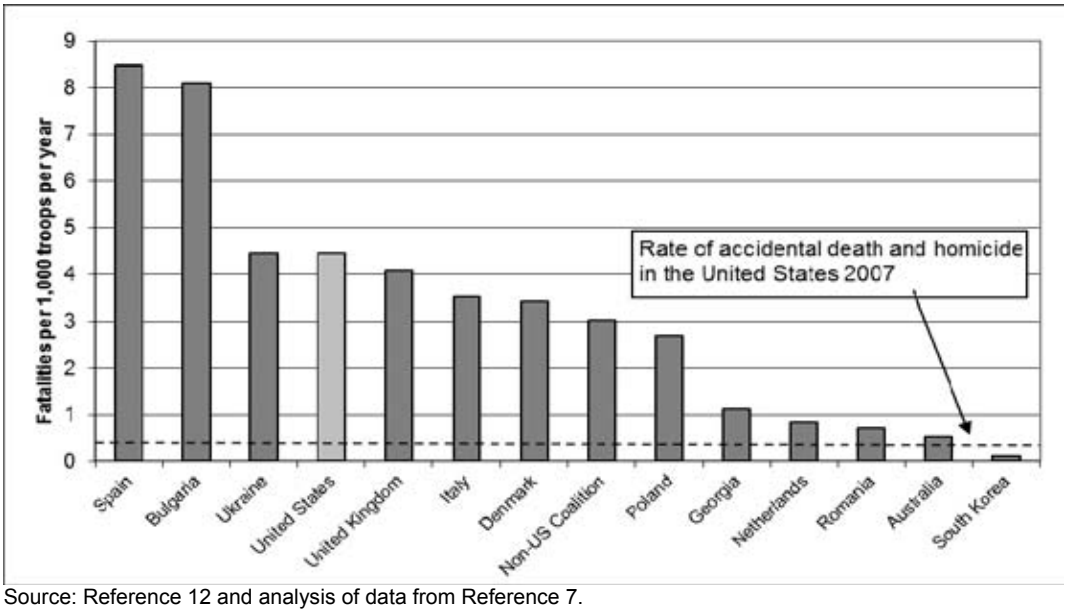
Source: analysis of data from Reference 7.

Although the United States suffered the vast bulk of casualties in the Iraq conflict, it did not experience the highest rate of casualties on a per troop-year basis. Two countries, Spain and Bulgaria incurred casualties at a much higher rate, while the Ukraine, United Kingdom, Italy and Denmark suffered casualties at a similar rate to the United States. At the same time, many coalition countries suffered losses at or below the rate of accidental death and homicide in the community.

The fact that some countries experienced fatalities at a much higher rate than the United States probably reflects several factors, most important being that a larger share of US forces were engaged in logistical, administrative and command activities than was the case with countries making small contributions. Also, differences in training and equipment may have been significant. Conversely, the extraordinarily

low rate of casualties enjoyed by some countries might reflect better training and equipment, although the active avoidance of risk by locating in benign environs was undoubtedly an important factor—as was clearly the case with Australia.

Figure 7.4: Fatalities per 1,000 troop-years in Iraq 2003- 2010

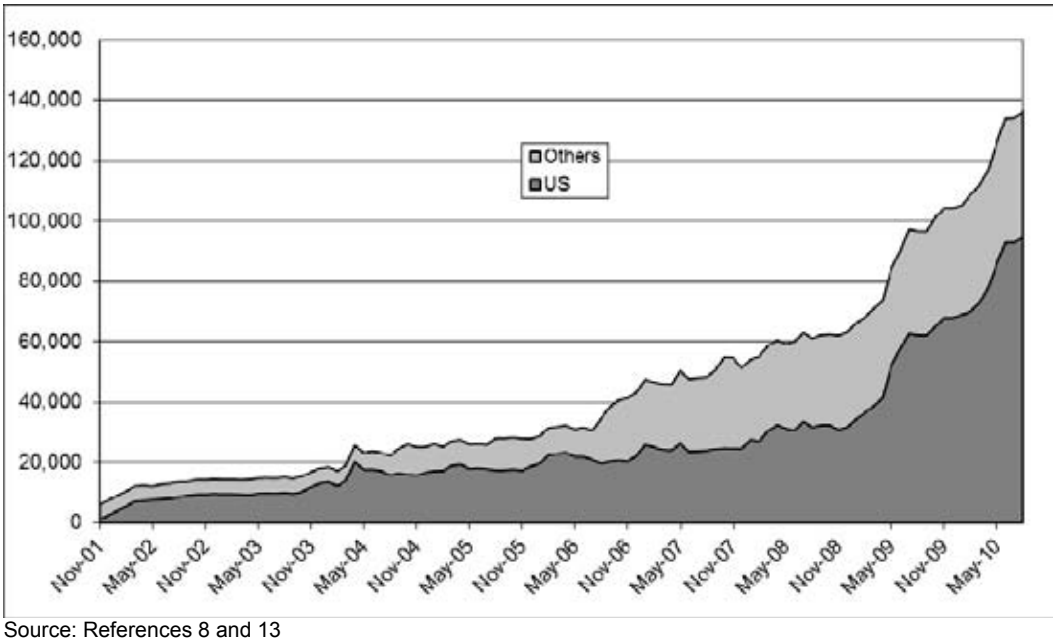


Source: Reference 12 and analysis of data from Reference 7.

Afghanistan – 2001 to 2010

The number of US and non-US troops in Afghanistan from late 2001 to 2010 is shown in Figure 7.5, where some interpolation has been necessary due to gaps in the data. Since the start of the operation, US forces have accounted for 238,575 troop-years (61%) and non-US forces 153,506 troop-years (39%).

Figure 7.5: US and other coalition troops in Afghanistan 2001 to 2010



Source: References 8 and 13

Afghanistan – March 2010

Table 7.8 shows the breakdown of coalition forces in Afghanistan as at March 2010. The figure for the United States represents the total number involved in *Operation Enduring Freedom* (87,300) including the US contribution to ISAF (50,590), while the figures for other countries represent the status of ISAF. Note that some countries are also making small contributions to *Operation Enduring Freedom* outside of ISAF. However, insufficient data is available to account for this. The breakdown of troop numbers in terms of NATO, non-NATO and US forces appears in Table 7.9 along with measures of the contributions relative to the population and military forces involved. Note that despite ISAF being a NATO mission, the United States still carries a greatly disproportionate share of the burden.

Once again, a proper comparison of burden-sharing requires taking account of concurrent contingency operations being undertaken by participants, including the ongoing commitment to Iraq by the United States. This is done in Table 7.10 where the size of other deployments is as at November 2009 from Reference 15. More detailed results are presented in Figures 7.6 and 7.7.

Although the United States continues to dominate by both measures, interesting results emerge for some smaller countries; in particular Ireland, Jordan, Sweden, Slovenia and the Czech Republic. Note that only the last two are members of NATO. And at the risk of appearing partisan, both Australia and New Zealand are making credible contributions relative to European and NATO countries.

Table 7.8: The international coalition in Afghanistan – March 2010

United States	87,300	Lithuania	220
United Kingdom	9,500	New Zealand*	220
Germany	4,335	Georgia*	175
France	3,750	Latvia	170
Italy	3,160	Macedonia	165
Canada	2,830	Estonia	145
Poland	2,140	Portugal	110
Netherlands	1,880	Finland*	95
Turkey	1,835	Azerbaijan*	90
Australia*	1,550	Slovenia	70
Spain	1,075	Armenia*	40
Romania	970	Singapore*	40
Denmark	750	UAE*	25
Belgium	560	Greece	15
Bulgaria	525	Bosnia and Herzegovina*	10
Norway	470	Luxembourg	9
Czech Republic	455	Ukraine*	8
Sweden*	410	Ireland*	7
Hungary	310	Jordan*	6
Croatia	270	Iceland	4
Albania	250	Montenegro*	4
Slovakia	230	Austria*	3

Source: references 13 and 14, * non-NATO

Table 7.9: Selected international deployed forces as at March 2010

* non-NATO	Afghanistan	Other	Total	Population	Armed Forces	Deployed Forces per million population	Percentage of defence force deployed
United States	87,300	140,112	227,412	317,641,000	1,580,000	716	14.39%
United Kingdom	9,500	3,324	12,824	61,899,000	175,000	207	7.33%
Germany	4,335	3,241	7,576	82,057,000	251,000	92	3.02%
France	3,750	9,870	13,620	62,637,000	353,000	217	3.86%
Italy	3,160	5,038	8,198	60,098,000	293,000	136	2.80%
Canada	2,830	123	2,953	33,890,000	66,000	87	4.47%
Poland	2,140	1,539	3,679	38,038,000	100,000	97	3.68%
Netherlands	1,880	124	2,004	16,653,000	47,000	120	4.26%
Turkey	1,835	797	2,632	75,705,000	511,000	35	0.52%
Australia*	1,550	1,301	2,851	21,512,000	55,000	133	5.18%
Spain	1,075	1,378	2,453	45,317,000	128,000	54	1.92%
Romania	970	297	1,267	21,190,000	73,000	60	1.74%
Denmark	750	280	1,030	5,481,000	27,000	188	3.81%
Belgium	560	467	1,027	10,698,000	38,000	96	2.70%
Bulgaria	525	176	701	7,497,000	35,000	94	2.00%
Norway	470	221	691	4,855,000	24,000	142	2.88%
Czech Republic	455	497	952	10,411,000	18,000	91	5.29%
Sweden*	410	279	689	9,293,000	13,000	74	5.30%
Hungary	310	543	853	9,983,000	29,000	85	2.94%
Croatia	270	170	440	4,410,000	19,000	100	2.32%
Albania	250	76	326	3,169,000	14,000	103	2.33%
Slovakia	230	379	609	5,412,000	17,000	113	3.58%
Lithuania	220	42	262	3,255,000	9,000	80	2.91%
New Zealand*	220	237	457	4,303,000	10,000	106	4.57%
Georgia*	175	5	180	4,219,000	21,000	43	0.86%
Latvia	170	1	171	2,240,000	6,000	76	2.85%
Macedonia	165	16	181	2,043,000	8,000	89	2.26%
Estonia	145	37	182	1,339,000	5,000	136	3.64%
Portugal	110	530	640	10,732,000	43,000	60	1.49%
Finland*	95	511	606	5,346,000	23,000	113	2.63%
Azerbaijan*	90	3	93	8,934,000	67,000	10	0.14%
Slovenia	70	434	504	2,025,000	7,000	249	7.20%
Armenia*	40	71	111	3,090,000	47,000	36	0.24%
Singapore*	40	2	42	4,837,000	73,000	9	0.06%
UAE*	25	0	25	4,707,000	51,000	5	0.05%
Greece	15	1,640	1,655	11,183,000	157,000	148	1.05%
Bosnia and Herzegovina*	10	12	22	3,760,000	11,099	6	0.20%
Luxembourg	9	27	36	492,000	1,000	73	3.60%
Ukraine*	8	528	536	45,433,000	130,000	12	0.41%
Ireland*	7	745	752	4,589,000	10,000	164	7.52%
Jordan*	6	1,990	1,996	6,472,000	101,000	308	1.98%
Iceland	4	0	4	319,000	130	13	3.08%
Montenegro*	4	3	7	626,000	3,000	11	0.23%
Austria*	3	1,087	1,090	8,387,000	27,000	130	4.04%

Source: Analysis of data from References 5, 8, 9, 14 and 15.

Figure 7.6: Deployed forces as a percentage of permanent forces as at Aug/Sept 2005

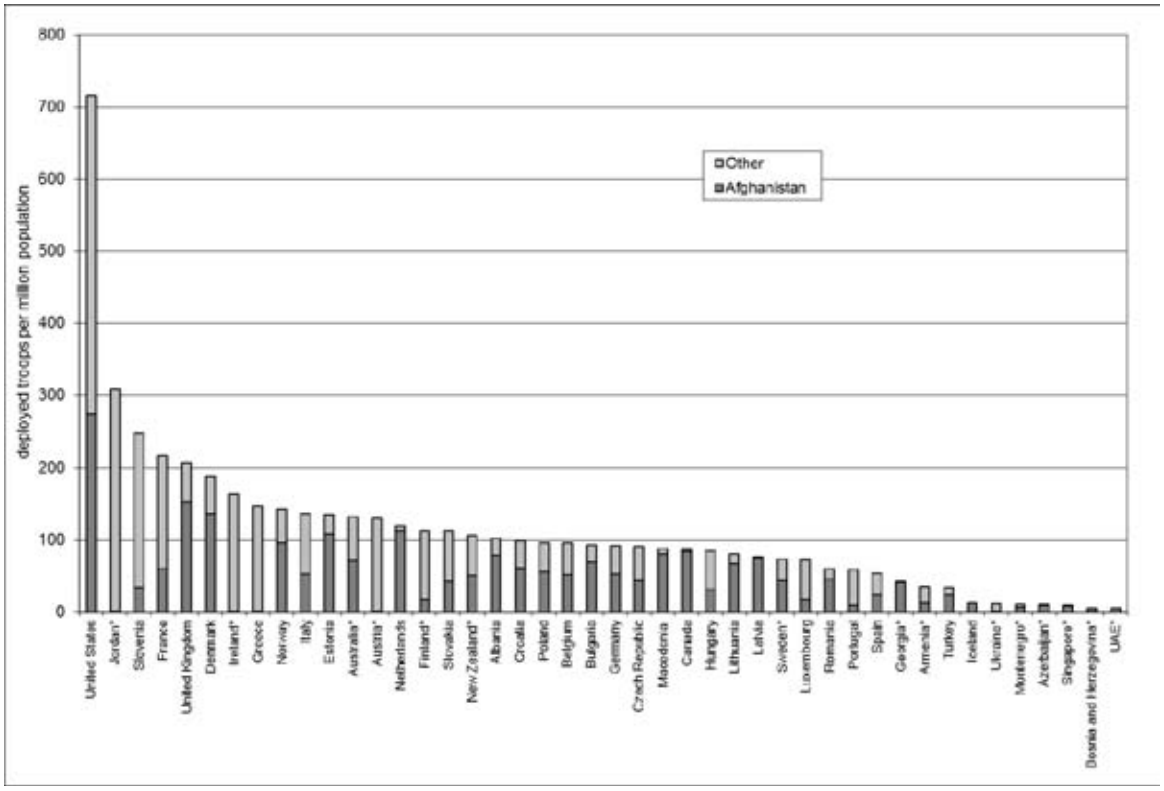


Figure 7.7: Deployed forces per million head of population as at March 2010

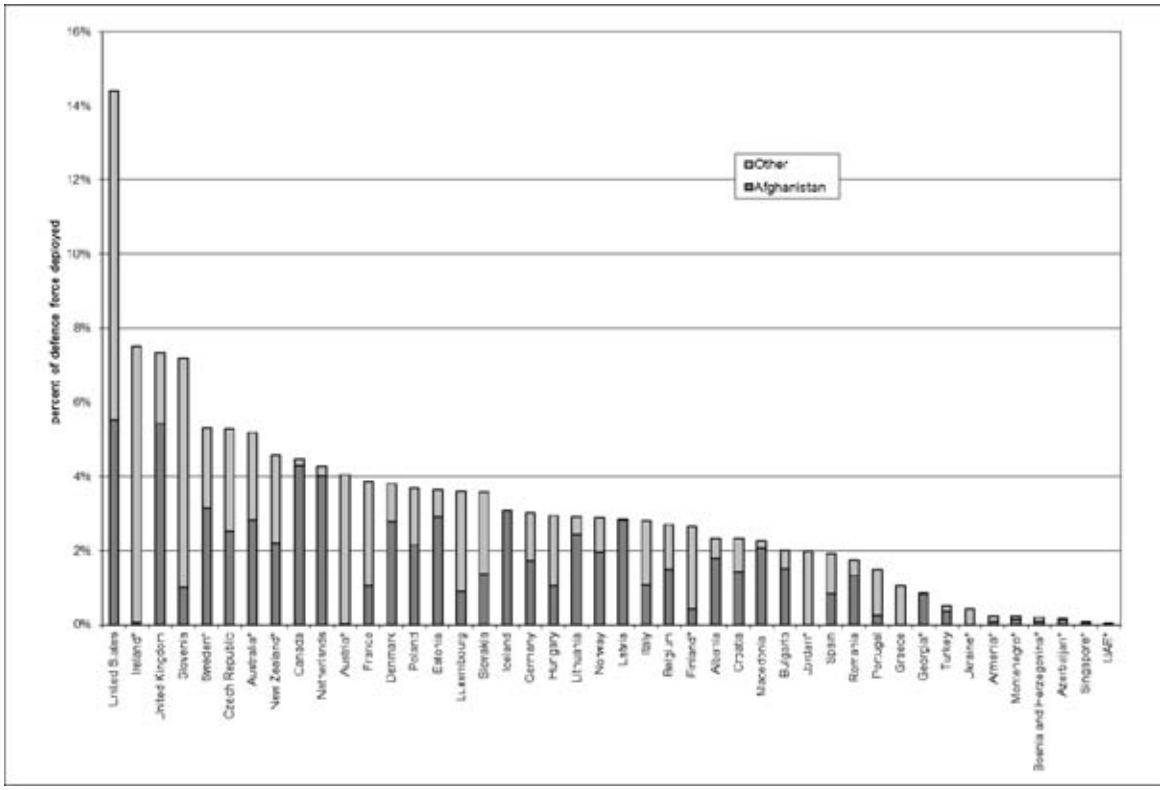


Table 7.10: Afghanistan and NATO – March 2010

	Troops	Per cent	Deployed forces per million population	Percentage of defence force deployed
United States	123,338	69.2%	275	5.5%
NATO (non US)	36,038	28.6%	61	1.5%
non NATO	2,848	2.3%	21	0.4%
Total	**126,186**	**100%**		

Source: Analysis of data from References 5, 8, 9, 14 and 15.

Afghanistan – Fatalities 2001-2010

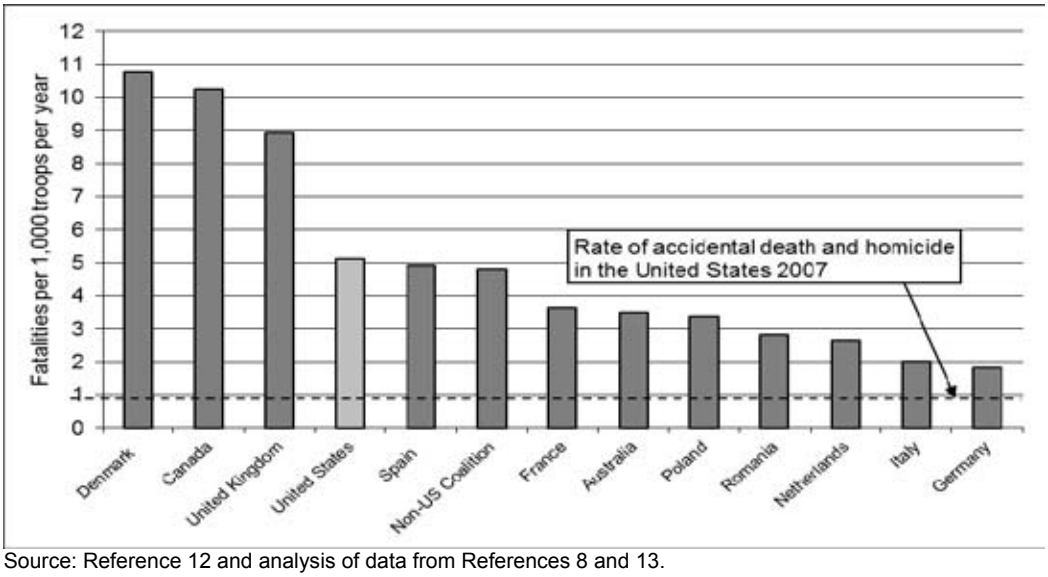
Sufficient data is available to estimate the number of troop-years contributed by some of the larger individual countries involved in the Afghanistan operation. The results are presented in Table 7.11 along with the fatality rates per troop-year. Fatality rates are also shown in Figure 7.8. The points made regarding the analogous data for Iraq apply equally here.

Table 7.11: Fatalities per troop-year in Afghanistan 2001-2010

Country	Troop-years in Afghanistan	Killed	Fatalities per 1000 troops per year
United States	238,575	1,224	5.1
Non-US	153,506	741	4.8
United Kingdom	37,033	331	8.9
Germany	23,003	42	1.8
Canada	14,749	151	10.2
Italy	13,562	27	2.0
France	12,403	45	3.6
Netherlands	9,100	24	2.6
Australia	6,297	22	3.5
Poland	5,932	20	3.4
Spain	5,701	28	4.9
Romania	5,321	15	2.8
Denmark	3,338	36	10.8

Source: Analysis of data from References 8 and 13.

Figure 7.8: Fatalities per 1,000 troop-years in Afghanistan 2001-2010



Source: Reference 12 and analysis of data from References 8 and 13.

Iraq and Afghanistan – Costs 2001-2010

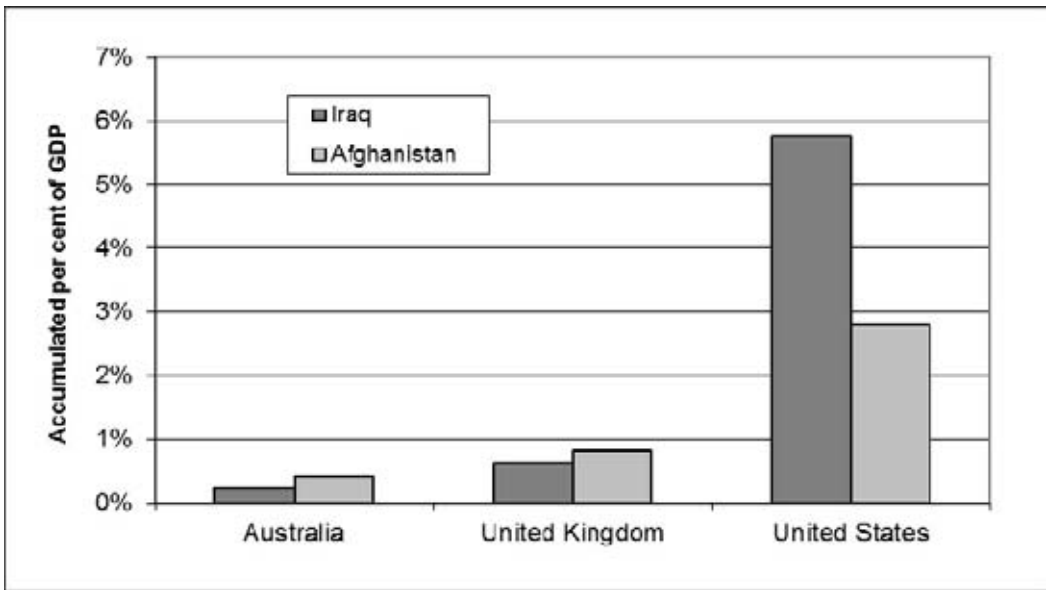
An interesting perspective can be gained by looking at the cost incurred by contributing countries. While data is difficult to find in general, costs are available for Australia, the United Kingdom and the United States. Table 7.12 shows the annual direct budgeted cost of deployments to Afghanistan and Iraq as a share of GDP for the three countries. The cumulative cost is plotted in Figure 7.9.

Table 7.12: Direct cost of deployments to Iraq and Afghanistan 2001-2011

	Australia		United Kingdom			United States	
						Iraq	Afghanistan
	Iraq	Afghanistan	Iraq	Afghanistan	2001	0.00%	0.10%
2001-02	0.00%	0.04%	0.00%	0.04%	2002	0.00%	0.10%
2002-03	0.04%	0.02%	0.09%	0.03%	2003	0.48%	0.13%
2003-04	0.03%	0.00%	0.11%	0.00%	2004	0.64%	0.12%
2004-05	0.03%	0.00%	0.07%	0.01%	2005	0.68%	0.16%
2005-06	0.04%	0.01%	0.07%	0.02%	2006	0.76%	0.14%
2006-07	0.04%	0.02%	0.07%	0.05%	2007	0.93%	0.28%
2007-08	0.04%	0.03%	0.10%	0.11%	2008	0.99%	0.30%
2008-09	0.02%	0.06%	0.10%	0.18%	2009	0.68%	0.42%
2009-10	0.00%	0.12%	0.00%	0.19%	2010	0.44%	0.71%
2010-11	0.00%	0.11%	0.00%	0.19%	2011	0.33%	0.78%
Total	**0.23%**	**0.41%**	**0.62%**	**0.82%**	**Total**	**5.92%**	**3.24%**

Source: Analysis of data from References 16, 17, 18 and 19.

Figure 7.9: Direct cost of deployments to Iraq and Afghanistan 2001-2011



The cost of US operations in Afghanistan and Iraq is higher than would be expected on the basis of troop numbers than for Australia and the United Kingdom. In part, this could reflect differences in budgetary arrangements in the three countries. More likely, however, is that the United States is actually carrying a disproportionately high share of the cost of operations (compared with personnel numbers) due to (1) a relatively greater proportion of expensive high-end capabilities like combat aircraft

and surveillance assets, and (2) a heavier reliance on contractor personnel to support the troop deployment. The latter is likely to be particularly important given that contractors outnumber US forces in-theatre. As of March 2010, there were 112,092 contractors in Afghanistan, 95,461 in Iraq, and 250,335 in the CENTCOM area of operations.

Notes and sources

The quotes from the Leader of the Opposition and the Prime Minister are taken from their opening statements in the Parliamentary debate on Afghanistan, 19 October 2010. For the argument in favour of a greater Australian contribution to the international effort in Afghanistan see Reference 21, and for the argument in favour of a larger contingent to accomplish our present mission see Reference 22. The economics of alliances is explained in References 23 and 24.

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CHAPTER 8 – DEFENCE TRANSPARENCY

It's been seven years since ASPI last surveyed the availability of information to the public about Defence. Since then, transparency has improved in some areas and gotten worse in others. This Chapter reviews what's disclosed and what's kept secret from the public. It concludes with suggestions for improved transparency.

Why is transparency important?

There are two arguments for disclosing as much as practical about Defence's activities performance. The first is one of principle. The government allocates close of 1.8% of everything Australia produces each year to the Department of Defence. That amounts to more than $1,200 for every man, woman and child in the country—or around $2,300 for every person in paid employment. As the 2009 White Paper put it, 'Taxpayers and their elected representatives should have a clear idea of where their defence dollars are going…'

The second argument is pragmatic. In most areas of public spending, taxpayers have an immediate grasp of what they are getting for their money. Few of us are more than one degree of separation from someone who has had recent experience with a hospital or school. So if something is amiss in heath or education, we know about it pretty quickly. And when election time comes around, our satisfaction or displeasure can be conveyed to those responsible. By this mechanism, governments are encouraged to strive for high standards of quality and efficiency in these areas of public policy.

Nothing like this sort of intimate connection arises in the case of Defence because very few people have any first-hand experience with what goes on. Absent a major war, we have no direct way of assessing the extent to which the defence force is properly equipped, trained and led. Thus, apart from the occasional leak, we have to rely on what we are told through official channels. This creates a moral hazard of the first order.

The ever present temptation for Defence executives must be to hide behind a veil of secrecy and conceal from the public any inefficiencies and failings. Who wouldn't want make to life easier for themselves in that way? And given the legitimate need to withhold some information on national security grounds, it's all too easy to do. Of course the Government faces exactly the same temptation, but it would be short-sighted to succumb.

Ministers have a hard enough time controlling Defence without putting themselves in the precarious situation of only getting advice from Defence (akin to an Education Minister who only ever talked to the teacher's union). To guard against this, Defence Ministers have to exploit the labours of third parties—the media, academics, Parliament and interested citizens—who are eager to sort through and understand what's going on. But this can only occur if information about Defence is made available. The most compelling reason for transparency about Defence is that it is a necessary precondition for effective Ministerial control.

What are the limits of disclosure?

Four things limit the disclosure of information about Defence; individual privacy, national security, commercial confidence, and the established convention that Cabinet

deliberations should remain undisclosed. Even taking a conservative approach to each of these factors, considerable latitude exists to say a lot about Defence's performance—certainly more than is presently made available. In what follows, the feasibility of greater disclosure will be argued on a case-by-case basis, often working on the principle that if something was disclosed in the past is should be possible to disclose it today.

The big picture

Before diving down into the esoteric world of 'flying hours' and 'sea days', it's worth pausing to ask what the Government (and in turn the community) wants from Defence. Any sensible disclosure of Defence's performance needs to appreciate what the ultimate goal is. At present, Defence pursues three non-administered 'outcomes' on behalf of the government:

Outcome 1: The protection and advancement of Australia's national interests through the provision of military capabilities and the promotion of security and stability.

Outcome 2: The advancement of Australia's strategic interests through the conduct of military operations and other tasks as directed by Government.

Outcome 3: Support for the Australian community and civilian authorities as requested by Government.

Outcome 1 partially subsumes the activities of DMO which are expressed in its single outcome, 'Contributing to the preparedness of the Australian Defence Organisation through acquisition and through-life support of military equipment and supplies.'

These three outcomes are used as a framework for cataloguing defence transparency in what follows. The chapter concludes with a discussion of the disclosure of defence funding information.

Outcome 1: 'provision of military capabilities'

The core of Outcome 1 is the provision of military capabilities. From 1999-00 until 2007-08, Defence was budgeted and reported largely on the basis of its capability 'outputs'. In the scheme employed, all activities and recurrent expenditure in Defence were *attributed* to one or another of the military capabilities being delivered. Since 2008-09 a different scheme has been in place whereby activities and recurrent expenditure are reported in terms of the actual organisational structure. No attempt is made to attribute expenditure to the capabilities delivered. Capital investment and operational supplementation are treated separately in both schemes.

The focus of the old scheme was on 'outputs'— the ultimate products—while the new scheme focuses on activities. Both perspectives are valid, and in a perfect world we would have visibility of both. Instead, we've turned the coin to reveal one side at the expense of the other. Unfortunately, in the transition from the old scheme to the new, the ability to track long-term trends was lost (although frequent changes within the old scheme had all but made that very difficult anyway). More seriously, the move from the old scheme to the new was accompanied by a coarser aggregation of information obscuring much of what was previously disclosed.

Table 8.1 outlines the loss of detail that arose in moving from 24 capability 'outputs' circa 2003-04 (when disclosure was at a peak) to today's four capability 'programs'.

Table 8.1: The coarse-graining from 'outputs' to 'programs'

Capability Outputs ~ 2003-04	Capability Programs ~ 2011-12
Navy Capabilities	Navy
Major Surface Combatants	
Naval Aviation	
Patrol Boats	
Submarines	
Afloat Support	
Mine Warfare	
Amphibious Lift	
Hydrographic & Oceanographic	
Army Capabilities	Army
Special Forces	
Mechanised	
Light Infantry	
Army Aviation	
Ground Based Air Defence	
Combat Support	
Regional Surveillance	
Operational Logistical Support	
Motorised Infantry	
Protective Operations	
Air Force Capabilities	Air Force
Air Combat	
Combat Support	
Strategic Surveillance	
Maritime Patrol	
Airlift	
Intelligence	Intelligence

Quantitative performance targets

As explained in Chapter 2, there are a large number of qualitative performance targets such as 'maintain robust relationships with our international partners' which appear in the PBS. As worthy as these might be, they provide few opportunities to track Defence's performance over time or to calculate cost-effectiveness. To do that, measurable physical targets are needed—and these are in short supply.

Two types of quantified measure are employed in the PBS and Annual Report; activity rates and availability rates.

Activity Rates

Activity rates measure how much a particular capability is used during the year. For example, the Navy, Army and Air Force forecast the number of 'flying hours' planned for each of their aircraft fleets. Inexplicably, no activity rate targets are given for the number of 'sea days' to be achieved by Navy's vessels or 'track miles' by Army's

armoured vehicles. In the case of Navy it was routine to provide targets for the number of sea days prior to 1997-98.

While activity rates are simplistic measures which fail to appreciate many of the facets that go into making up military capability, they can be an important diagnostic nonetheless. There are three reasons to introduce activity rate targets for Navy vessels in terms of days spent at sea, and for Army armoured vehicles in terms of 'track miles'.

First, activity performance targets relate directly to the accrual framework which itself focuses on activities rather than cash. Many expenses will rise and fall with activity levels. Consequently, visibility of activity levels is 'the other half of the equation' in understanding the financial statements.

Second, activity rates can be a useful pointer to management problems and issues. Some time ago, Navy planned to undertake 4,450 *Seahawk* helicopter flying hours during the year but only achieved 73% of that target. This indicated that Navy had not achieved some 1,189 hours of training and exercises previously deemed necessary for the delivery of their output. Unless some more efficient way of delivering the output with less flying hours had been found, it was difficult to escape the conclusion that the output has not been delivered in full. In fact it transpired that there were problems in personnel shortages including insufficient instructors.

Third, and somewhat specific to Navy, the numbers of planned versus achieved sea days is a direct measure of the additional demands being shouldered by the men and woman of the RAN (and their families) when operational demands boost time at sea.

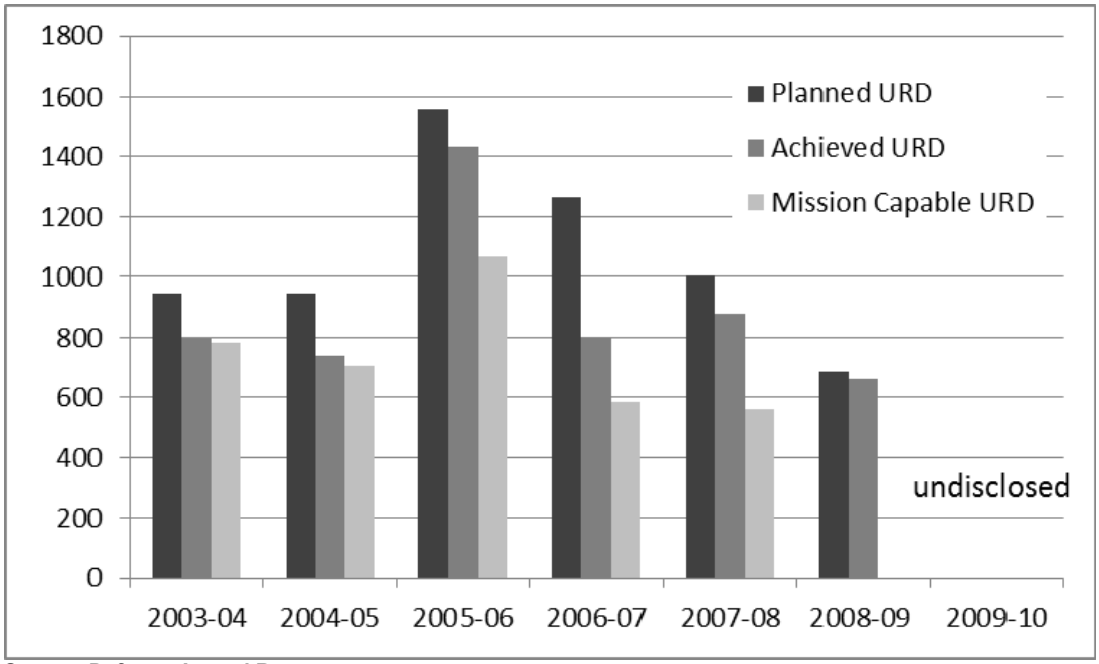
Availability Rates

Availability rates measure the number of days that a given capability is ready and able to be employed. Navy describes the availability of its vessels in terms of Unit Ready Days (URD); 'the aggregate number of days that constituent force elements are available for tasking'. These are forecast in the Budget papers and reported in the Annual Report. For a while, the number of 'mission capable' URD was also reported. Although the details were not entirely clear, 'mission capable' represented a subset of URD. In any case, it has not been disclosed as a quantitative measure since 2008-09 and now appears only as single qualitative measure for the entire Navy. Depending on how it is applied, 'mission capable' may capture an activity rate of sorts.

From 2009-10 onwards, the number of submarine URD has been combined with that for surface combatants so that we now have no easy way of knowing whether there are problems in either fleet. The imperative to conceal submarine performance is probably explained by Figure 8.1. According to the Australian National Audit Office (Report #23, 2008-09) the minimum availability requirement for the *Collins* fleet was 1,533 days per year, and that the original maintenance schedule sought to deliver 1,350 days per year.

The attainment or otherwise of planned URD and Mission Capability measures the effectiveness of Navy's personnel, training and logistics systems in maintaining vessels and their crews ready for action. For exactly these reasons, the same sort of measures should be applied to ADF aircraft and armoured vehicle based capabilities.

Figure 8.1: Submarine availability



Source: Defence Annual Reports

The argument is further strengthened by the fact that the acquisition of capabilities is increasingly moving towards specifying the average number of platforms to be mission capable per day. This is how both the Aerial Reconnaissance & Fire Support Helicopter and Hawk Lead-in-Fighter projects defined their goals. If this is how we are going to specify future capabilities, it makes sense to plan, measure and report against similar targets.

More generally, there is no reason why the approach taken to measuring URD for a naval platform cannot be extended to an air force squadron or and army battalion or brigade. This would provide a quantified measure of the extent to which capabilities were ready to be employed. Table 8.2 draws together proposed performance measures for various ADF platforms in terms of activity and availability targets.

Table 8.2: Possible Activity and Availability Rate Measures for ADF Capabilities

Platform/Capability	Activity Rates	Availability Rates
Ships & Submarines	sea days per annum (or mission capable days)	URD per annum
Planes & Helicopters	flying hours per annum	URD per annum
Armored Vehicle Units	track miles per annum field training days per annum	URD per annum
Other capabilities	n/a	URD per annum

	Measures currently reported

Preparedness Targets

Preparedness is a capability's readiness to undertake and sustain operations. Critically, preparedness differs from readiness in that it takes account of the ability to

sustain and resupply a capability on operations. Apart from military operations, preparedness is the key deliverable for the Defence organisation.

Preparedness is measured relative to the targets in the CDF's Preparedness Directive. It used to be that the achievement or otherwise of preparedness was reported down to the level of the 24 outputs listed in Table 8.1. In addition, an allied measure 'the maintenance of core skills' was similarly reported. Each of these targets was reported as either 'achieved', 'substantially achieved', 'partially achieved' or 'not achieved'. This provided a useful way of tracking problems and their remediation. However, since the introduction of the new Outcome scheme, these critical performance targets are only reported in aggregate for each Service.

Capital investment

The ability to deliver capability tomorrow depends on the development of capability today. Governments have struggled long and hard in this area. Two challenges arise. First, in the case of approved projects, the challenge is to ensure that projects are delivered on time, within budget and to specification. Second, in the case of unapproved projects, the challenge is to formulate a Defence Capability Plan that is affordable and deliverable. For the general reasons already discussed, transparency has a role to play in driving improvement in each case.

Over the past decade good progress has been made in improving the disclosure of information about major capital investment projects. Not only do the PBS and Annual Report now provide greater detail than in the past about individual projects, but the top thirty rather than just the top twenty projects are now subject to disclosure. In addition, reporting continues on projects which were once in the top thirty but have now slipped lower in the ranking. Cost approval variations are also reported in the Annual Report for the top thirty projects. DMO should be commended for the steady improvement in the disclosure of information about major projects (and also for now reporting the sustainment costs of the top twenty sustainment fleets).

For the past several years, the Australian National Audit Office has been conducting an annual independent audit of the larger major capital equipment projects. This usefully adds to the disclosure by DMO.

One area where transparency could be improved is in the disclosure of project schedules. Slippage of delivery is a major problem in the capital investment program and a lot of effort has been put into trying to limit delays. Unfortunately, present reporting on project delays is much less clear than it could be. For one thing, there is no single table in the PBS or Annual Report listing the original and current delivery dates of projects. So if you want to find out the extent of delays, there is little choice but to compare the narrative accompanying individual projects from one year to the next and hope that the relevant information is available. To further complicate matters; schedule performance is often reported against revised delivery baselines which take no account of accumulated delays prior to the new baseline.

There is no reason why project slippage cannot be reported regularly for the top thirty approved projects in the format used back in the early 1990s, see Figure 8.2. A similar presentation of major changes to scope would also be useful. It would not be worth doing so for unapproved projects given the volatility in the program.

Figure 8.2: Project schedule reporting from 1990

Delivery Schedule for Prime Equipment - Significant Projects

Project	Original projected completion	Projected completion 1 July 1990	Projected completion 30 June 1991
Collins Class Submarines	Oct 1999	Oct 1999	Oct 1999
Anzac Ships	Feb 2005	Feb 2005	Feb 2005
Australian Frigates	Jun 1994	Nov 1993	Nov 1993
Seahawk Helicopters	Aug 1989	Aug 1991	Aug 1991
Raven	Oct 1990	Sep 1992	Sep 1992
F/A-18 Hornet	May 1990	May 1990	Completed
Basic Trainer PC9	Nov 1991	Feb 1992	Feb 1992
Black Hawk Helicopters	Mar 1991	May 1991	Completed
F111 Avionics Update	Mar 1996	Mar 1996	Mar 1996
Jindalee	Jun 1997	Jun 1997	Jun 1997

Source: 1990-91 Defence Annual Report

While disclosure of information about approved projects has been improving, the opposite has occurred in the case of unapproved projects. This is manifest in the use of coarser cost and schedule bands in the public Defence Capability Plan, see Table 8.3 and Figure 8.3. As can be seen, the long-term trend has been to increasingly obscure the prospective cost and schedule details. As demonstrated in Chapter 4 of this Brief, with a little ingenuity and simple statistics the overall picture can be uncovered. But this says nothing about the progress of the individual projects which make up the program—the individual projects that industry have to make business decisions about.

Fortunately, the 2010 update of the DCP extended the three-year schedule bands out to a ten-year time horizon and marginally improved the granularity of cost bands. While this is a welcome development, it is a long way short of the fuller disclosure that arose in previous years. Regrettably, the PBS now also provides much less detail than it did in the past about the projects to be approved in the year ahead. The inevitable impact of declining disclosure is that Defence escapes accountability for the quality of its planning.

An extended discussion of the disclosure of capability planning information was undertaken by ASPI for the government in 2009; see Purnell and Thomson, *How Much Information is Enough?,* ASPI 2010. Although this led to some improved disclosure, a great many of the recommendations were rejected. Among those that were accepted, the following are yet to be implemented by Defence almost 12 months later:

- Establish a ‘one stop shop’ internet website with links to all Defence capability and acquisition programs.
- Publish a public Major Capital Facilities program with a 2-year horizon.
- Develop a project website for each approved project to provide information that is at least as detailed as that in the Public DCP.

More generally, the recommendations that were accepted from the 2009 Review have been incorporated into the December 2010 revision of the DCP.

Table 8.3: Cost bands for unapproved projects

<table>
<tr><th>$ million</th><th>Pink Book 1992–1996 to 1995–1999</th><th>Pink Book 1996–2000 to 1998–2003</th><th>Pink Book 1998–2003 (version 2)</th><th>Defence Capability Plans 2001, 2002 & 2004</th><th>Defence Capability Plan 2006</th><th>Defence Capability Plan 2009 [a]</th><th>Defence Capability Plan 2010 [a]</th></tr>
<tr><td>0 to 2</td><td>0 to 2</td><td rowspan="3">0 to 20</td><td rowspan="3">0 to 20</td><td>0 to 10</td><td rowspan="3">0 to 20</td><td rowspan="6">0 to 100</td><td rowspan="6">0 to 100</td></tr>
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<tr><td>200 to 250</td><td rowspan="6">over 200</td><td rowspan="4">200 to 500</td><td rowspan="4">200 to 500</td><td>200 to 250</td><td>200 to 250</td></tr>
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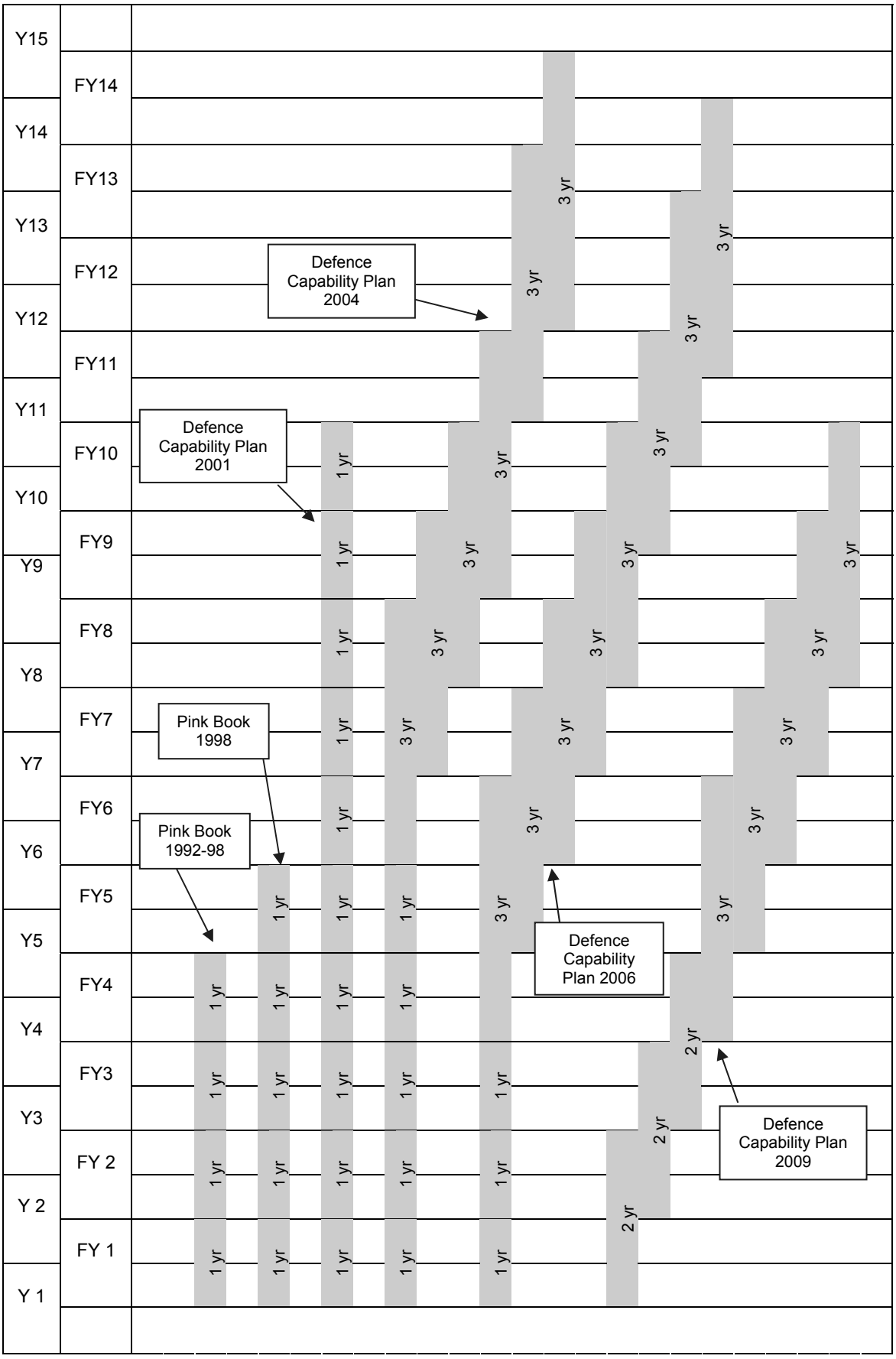
<tr><td>1500 to 2000</td><td>1500 to 2000</td><td>1500 to 2000</td><td rowspan="6">over 1500</td></tr>
<tr><td>2000 to 2500</td><td rowspan="5">over 2000</td><td>2000 to 2500</td><td>2000 to 2500</td><td rowspan="2">2000 to 3000</td></tr>
<tr><td>2500 to 3500</td><td>2500 to 3500</td><td>2500 to 3500</td></tr>
<tr><td>3500 to 4500</td><td>3500 to 4500</td><td>3500 to 4500</td><td rowspan="2">3000 to 5000</td></tr>
<tr><td>4500 to 6000</td><td>4500 to 6000</td><td>4500 to 6000</td></tr>
<tr><td>6000 to 10000</td><td>6000+</td><td>6000+</td><td rowspan="2">5000 to 1000</td></tr>
<tr><td>10000+</td><td></td><td></td><td></td><td></td><td></td><td></td><td>10000+</td></tr>
</table>

[a] Costs are described as being ‘towards the lower end of the range’, ‘towards the middle of the range’ and ‘towards the upper end of the range’.

Note: the 5-year Unclassified Pink Book was in operation at least as far back as 1987.

Figure 8.3: Schedule bands used in successive DCP (year of decision)



Outcome 2 & 3: 'military operations' and 'support'

Few areas of defence activity carry greater sensitivity than the conduct of military operations. For this reason, it is understandable that disclosure is carefully controlled and limited. And while the media would probably like to have greater access, the present level of disclosure is not unreasonable even though it probably falls below that provided by our allies to the media in some circumstances.

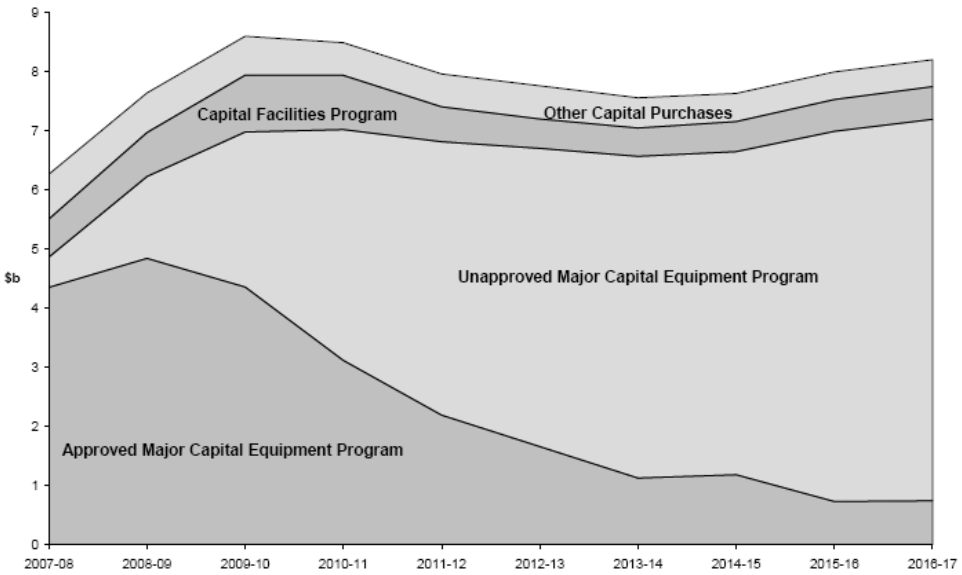
When it comes to supporting the community as occurred recently with the Victorian bush fires and Queensland floods, disclosure is timely and comprehensive.

Disclosure of defence funding

Once upon a time, defence used to disclose its funding plan a decade ahead—both in terms of total funding and capital investment. This was an important discipline; it made the promise of 3% real growth transparent and verifiable. All this was lost with the publication of the 2009 Defence White Paper and the subsequent large deferrals of spending. While we have bold claims of a commitment to continuing growth, the government is unwilling to disclose the actual numbers. There can be no national security justification for this evasion. The only hint we have is from a Treasury report in 2010 which allowed long-term defence funding to be inferred (but only to the extent it was possible to reverse engineer Treasury's 40-year economic growth model). Similarly, the only data available on long-term investment trends comes from a PowerPoint presentation by a Defence official at a conference.

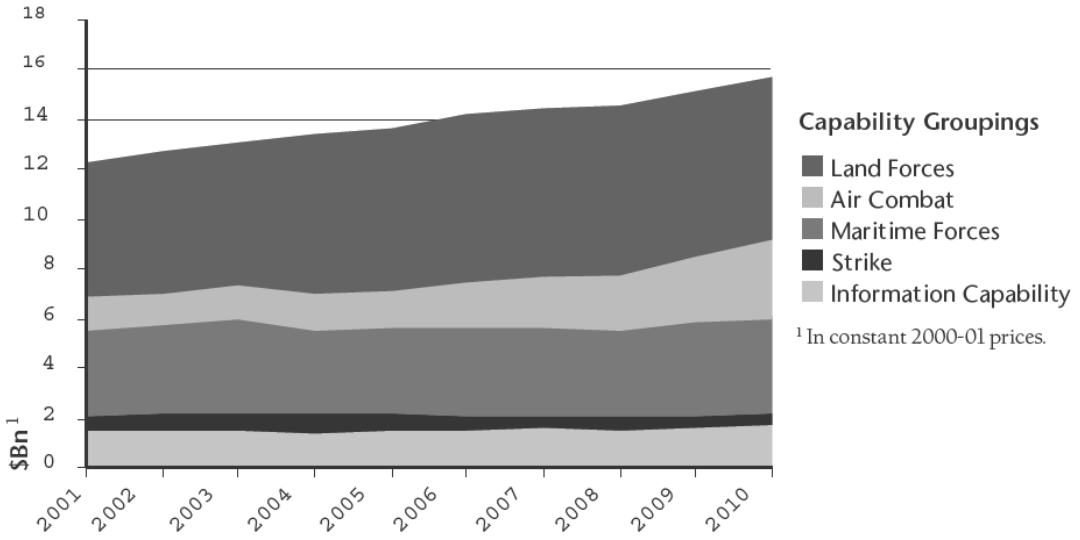
To make absolutely clear that the present level of secrecy is unjustified, tables and graphics from pre-2009 Defence publications have been assembled to show just how easy it is be up front about defence spending.

Figure 3.1: Defence Capital Investment Program 2007-08 to 2016-17



Source: *PBS 2007-08*, p.69, Department of Defence Canberra, 2007.

Defence Funding - Total Estimated Cost by Five Broad Capability Groups



Source: *Defence 2000: Our Future Defence Force*, p.122, Department of Defence Canberra, 2000.

Table 1.3: Defence White Paper Funding from 2001-02 to 2010-11

	2001-02 $b	2002-03 $b	2003-04 $b	2004-05 $b	2005-06 $b	2006-07 $b	2007-08 $b	2008-09 $b	2009-10 $b	2010-11 $b	Total $b
Previous Defence Funding from Government	12.5	12.6	13.3	13.2	12.9	13.2	13.3	13.6	13.8	14.1	**132.5**
East Timor/Force Generation	0.7	0.5	0.6	0.4	0.5	0.5	0.5	0.5	0.5	0.5	**5.2**
Defence White Paper Increase (1)	0.5	1.0	1.5	2.0	2.4	3.1	3.5	3.6	4.4	5.2	**27.2**
Exchange Rate Impact – White Paper	0.1	0.1	-	-	-	-	-	-	-	-	**0.2**
Sub-Total Defence Revenue (2)	**13.8**	**14.2**	**15.4**	**15.6**	**15.8**	**16.8**	**17.3**	**17.7**	**18.7**	**19.8**	**165.1**
Foreign Exchange Contingency(3)	-	-	-	-	-	-	0.1	0.1	0.1	0.1	**0.4**
Total	**13.8**	**14.2**	**15.4**	**15.6**	**15.8**	**16.8**	**17.4**	**17.8**	**18.8**	**19.9**	**165.5**

Notes

1. Defence White Paper allocations are in 2003-04 budget prices and outturned.
2. Cross references to Table 1.4: Defence Funding from Government.
3. Foreign exchange contingency held by the Department of Finance and Administration.

Source: *PBS 2003-04*, p.20, Department of Defence Canberra, 2003.

Table 1.2: Current White Paper Funding Allocations (Outturned, 2004-05 prices)

		2001-02 $m	2002-03 $m	2003-04 $m	2004-05 $m	2005-06 $m	2006-07 $m	2007-08 $m	2008-09 $m	2009-10 $m	2010-11 $m	2011-12 $m	2012-13 $m	2013-14 $m	Total $m
	Major Capital Equipment														
	Original allocation	510	1,051	1,506	1,537	1,663	2,234	2,345	2,241	2,749	3,374	-	-	-	**19,210**
	Reprogramming	-	-200	-712	-273	-446	-462	-133	564	649	469	354	298	213	**321**(1)
A	**Revised expenditure/allocation**	**510**	**851**	**794**	**1,264**	**1,217**	**1,772**	**2,212**	**2,806**	**3,397**	**3,843**	**354**	**298**	**213**	**19,531**
	Through-life Support Costs for Defence Capability Plan Projects														
	Original allocation	-	-	-	193	234	284	418	500	591	630	-	-	-	**2,850**
B	**Revised allocation**	**-**	**8**	**21**	**60**	**172**	**278**	**418**	**513**	**674**	**705**	**-**	**-**	**-**	**2,850**
	Allocated	-	8	21	52	12	16	15	19	18	17	-	-	-	**150**
	Unallocated	-	-	-	8	160	262	403	494	655	688	-	-	-	**2,700**
	Two Per Cent Real Growth in Personnel Costs														
	Allocated	-	-	-	236	253	270	289	309	326	391	-	-	-	**2,075**
	Unallocated	-	-	-	-	114	235	361	495	639	789	-	-	-	**2,634**
C	**Total**	**-**	**-**	**-**	**236**	**367**	**505**	**650**	**805**	**965**	**1,180**	**-**	**-**	**-**	**4,709**
D	**Operating Baseline Adjustment**	**-**	**-**	**-**	**116**	**130**	**137**	**143**	**149**	**155**	**156**	**-**	**-**	**-**	**986**
	Total (A+B+C+D)	**510**	**859**	**815**	**1,676**	**1,887**	**2,693**	**3,423**	**4,273**	**5,191**	**5,884**	**354**	**298**	**213**	**28,076**

Note

1. The amount of $321m is due to price outturning associated with the reprogramming of the Defence Capability Plan.

Source: *PBS 2004-05*, p.16, Department of Defence Canberra, 2004.

Disclosure of personnel information

As a general rule, Defence discloses a great deal of information about its personnel numbers, costs and structure. There are, however, three areas where greater transparency would be valuable.

Unacceptable behaviour

In 2007-08 the level of detail disclosed about unacceptable behaviour in the ADF and Department of Defence declined. Given the recent public interest regarding behaviour in the defence force, the earlier level of disclosure should be reinstated.

DMO military personnel numbers

For reasons that are unknown, the 2011-12 PBS does not disclose the number of military personnel in DMO.

Group personnel numbers

With personnel reductions playing a key role in the Strategic Reform Program (SRP), the number of civilian and military personnel allocated to groups is of considerable interest. However, although budget allocations are now based around the organisational structure, personnel statistics are not. Figure 8.4 taken from the 1998-99 annual report shows how easy this would be.

Figure 8.4: Personnel information for Defence groups 1999

Table I.1 : Personnel Numbers By Group [1] and Rank – 1998-99 Achieved Average Strength[2]

GROUP [1]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
NAVY															
1 Star Officers and above	7	11	0	0	1	4	3	1	4	0	0	0	1	1	33
Senior Officers [3]	48	150	0	1	3	22	6	60	35	3	5	3	16	2	354
Officers	106	1,500	4	9	21	220	311	208	71	2	11	6	91	3	2563
Other Ranks	108	8,950	25	6	186	268	10	505	8	4	39	13	582	5	10711
Reserves [4] [5]	0	762	0	0	0	371	0	94	0	0	0	0	0	0	1227
Total	269	11,373	29	18	211	885	330	868	118	9	55	22	690	11	14,888
ARMY															
1 Star Officers and above	11	0	10	0	1	5	1	4	1	0	1	1	0	0	44
Senior Officers [3]	65	0	217	2	10	78	5	76	19	3	16	12	21	3	547
Officers	161	3	2,819	24	20	400	467	307	61	6	23	34	169	3	4497
Other Ranks	212	18	15,289	74	140	842	35	863	24	0	24	142	1416	2	19081
Reserves [4] [5]	112	0	20,399	0	0	47	0	860	0	0	0	0	158	0	21486
Total	581	21	38,553	100	171	1,372	508	2110	105	9	64	189	1764	8	45,655
AIR FORCE															
1 Star Officers and above	7	0	0	14	1	4	0	2	4	0	0	0	0	1	33
Senior Officers [3]	50	1	3	193	8	45	6	63	48	3	9	15	11	4	459
Officers	90	3	17	2,113	23	385	321	281	182	2	45	96	95	2	3555
Other Ranks	80	3	23	8,253	186	2753	12	588	132	0	19	436	433	0	10918
Reserves [4] [5]	5	0	0	1,765	0	136	0	355	0	0	0	0	42	0	2303
Total	232	7	43	10,338	218	3,323	339	1289	366	5	73	547	581	7	17,368
CIVILIANS															
Senior Executives	14	1	1	1	12	2	3	8	20	18	4	5	3	8	100
Senior Officers [3]	97	0	23	71	220	338	28	163	461	1057	46	144	0	124	2772
Others	123	506	880	289	600	4115	99	1269	782	992	295	436	3190	190	13769
Total	234	507	904	361	832	4,458	130	1,460	1,243	2,067	345	585	3,193	322	16,641
TOTAL DEFENCE	1,316	11,908	39,529	10,817	1,432	10,098	1,307	5,727	1,832	2,090	537	1,343	5,228	348	94,552

Source: Defence Annual Report 1998-99

Disclosure of the Strategic Reform Program

Initially, the SRP was accompanied by considerable disclosure of its plans and goals, including through the booklets published in May 2009 and April 2010. However, disclosure since has been very limited and the 2009 Annual Report was particularly unforthcoming. Further discussion of the SRP can be found in Chapter 4 of this Brief.

CHAPTER 9 –SELECTED MAJOR PROJECTS

1. **ADF aviation training (AIR 5428 and AIR 9000 Phase 7)**
Gregor Ferguson

2. **The ADF's airlift capability**
Gregor Ferguson

3. **Uncertain steps towards an amphibious capability**
Tom Muir

4. **Air warfare destroyer (SEA 4000)**
Gregor Ferguson

5. **Enhanced force protection measures**
Tom Muir

6. **Protected military vehicle—light (LAND 121 Phase 4)**
Tom Muir

7. **The future submarine (SEA 1000)**
Gregor Ferguson

8. **Improving and sustaining the *Collins*-class submarine (SEA 1439)**
Tom Muir

9. ***Anzac* frigate anti-ship missile defence (SEA 1448 Phase 2B)**
Gregor Ferguson

10. **The Navy's future frigate (SEA 5000)**
Gregor Ferguson

Gregor Ferguson is the editor of *Australian Defence Magazine*, for which Tom Muir is a senior writer.

ADF Aviation Training

Gregor Ferguson

The ADF is about to overhaul the way it trains pilots for all three services. At the time of writing (April 2011), Defence was preparing draft Requests for Tender (RFT) for two separate but concurrent projects that will significantly change the way the ADF trains its airmen and women.

Project AIR 5428 Pilot Training System (PTS) will see the introduction of an all-new fixed-wing pilot training system, for the ADF, while Project AIR 9000 Phase 7 Helicopter Aircrew Training System (HATS) will introduce a new training system for Army and Navy helicopter pilots and aircrewmen and Navy Aviation Warfare Officers (AvWOs).

There are several triggers for this overhaul. First, dissatisfaction with the time and expense currently involved in training ADF pilots—it can take over two years between the start of basic flying training and the completion of advanced training. Second, the RAAF anticipates a need for additional fast jet pilots when the F-35A Joint Strike Fighter (JSF) starts to enter service around 2018, and the training pipeline must be able to meet this increased demand and impart the skills required for highly automated 4th and 5th generation fighters. These pressures coincide with the Strategic Reform Program (SRP), which is driving a more generalised need to reduce training costs without compromising quality.

Third, the ADF also wants to rationalise its rotary wing flying training, which the Army and Navy perform separately. Fourth, the impending retirement of aircraft such as the C-130H and AP-3C *Orion* will see both a reduction in demand for the old 'navigator' skill-set and a change in the mix of skills required by modern Air Combat Officers (ACOs). So a third Project, AIR 5232, will see an overhaul of the training system for AvWOs and ACOs. First pass approval for this project is due in the 2011–12 financial year.

Finally, and more practically, the ADF's training aircraft are all getting older, notably the Pilatus PC-9A advanced trainer (which reaches life of type in 2015) and the venerable CT-4B piston engine trainer.

In short, this is a rare opportunity to overhaul and streamline the entire flying training process by introducing a new generation of aircraft and simulators. It's also an opportunity to attack the costs of flying training by appointing industry prime contractors to manage the equipment and conduct some of the training under a Performance-Based Contract.

AIR 5428 is worth around $1.5 billion while AIR 9000 Ph.7 is worth close to $1 billion. Both will generate several billions of dollars of recurring expense over the period of their contracts. Despite the synergies between them, they are being contracted separately through different project offices. However, they are still being tendered concurrently. Given that the same potential prime contractors have expressed an interest in both projects, this means an increased bidding cost, as they will need to prepare two similar but quite separate tender responses at the same time.

The Current System

The ADF's current flying training system resembles a funnel with a wide mouth and narrow nozzle. All potential pilots begin their careers the same way: some 275 candidates a year are identified as potential pilot candidates on the basis of aptitude and prior experience (if any) and then undergo a two-week assessment at the hands of the ADF Pilot Selection Agency (PSA) at Tamworth Airport. The output is normally around seventy-five pilots a year for all three services, about half of whom are Army helicopter pilots.

About 170 or so candidates are usually found suitable, of whom typically 125–130 actually begin training. They remain at Tamworth, where BAE Systems Australia has operated the ADF's Basic Flying Training System (BFTS) and PSA Flight Screening program since 1998. BAES received a six-year, $86.6 million Interim BFTS contract earlier this month to continue providing the BFTS until the system selected under AIR 5428 comes into effect. The company provides the aircraft and a cadre of twenty-two Qualified Flying Instructors (QFI—most of them ex-military). These are leavened by twenty-three ADF QFIs who provide the essential service experience and ensure professional standards are maintained. All PSA and BFTS 'check' flights and flying tests are carried out by ADF instructors.

The twenty-five week BFT course is a sixty-four flying hour syllabus; RAAF and RAN students then go to 2 Flying Training School (FTS) at RAAF Base Pearce, WA, to join the Advanced Flying Training System (AFTS).

Army pilots do a further thirty-eight hours at Tamworth before going to the Australian Army Aviation Centre at Oakey to commence rotary wing conversion in the hands of another private sector contractor, Boeing Australia Ltd, whose nineteen QFIs put pilots through the 102 hour Helicopter Qualification Course using eleven ageing but still reliable Bell 206 *Kiowas*. They then graduate to the Operational Type Transition Course (OTTC) and operational conversion to the *Black Hawk*, MRH90, *Tiger* Armed Reconnaissance Helicopter (ARH) or *Chinook*.

Army helicopter pilots get a gentler introduction to operational flying than their Navy counterparts: once trained, they become co-pilots of operational types such as the *Black Hawk* and MRH90 before graduating to the aircraft captain's right hand cockpit seat, typically on their second operational tour.

Navy helicopters, by contrast, are typically flown by single pilots. As well as the burden of captaincy, young pilots also face the challenge of over-water navigation and operating from frigate flight decks by day and night. The Navy maintains that they need around 500 hours experience before they are ready to be deployed at sea as a solo aircraft captain, which is why Navy pilots spend additional time in the PTS and undergo the same advanced flying training course as RAAF fighter pilots.

Once they graduate from 2 FTS, Navy pilots transfer to Nowra to undergo the 114 hour Pilot Rotary Course on the *Squirrel*. This elderly aircraft is also used to train helicopter Aircrewmen, SENSOs and AvWOs, formerly called Observers: the airborne tacticians who direct the Navy's *Seahawks*.

RAAF student pilots are all potentially fighter pilots when they enter the training system. Their strengths and weakness (some of them age and maturity-related) result in some degree of self-selection, particularly during Advanced Flying Training. This 120-hour, nine month syllabus takes students up to the award of their pilot wings, at which point they are 'streamed' according to aptitude and ability as Fast Jet, or Multi-Crew (AP-3C, C-130, C-17, *Wedgetail* etc). A number of potential fast jet pilots fly a multi-crew tour first to gain experience and maturity before converting to fighters.

About 25% of RAAF pilots and about 10% of Navy pilots fail to complete their advanced training. Historically, the overall pass rate for RAAF student pilots has been around 55%, though this has climbed recently to about 75%.

So what's wrong with that?
The Chief of Air Force, AM Mark Binskin, summed it up at a Williams Foundation seminar on flight training in 2010: 'Our current system takes too long and our suspension rates are too high in both the undergraduate and post graduate arenas.

'The system produces too few Fast Jet-capable aircrew, and—by default—too many Multi-Crew pilots. This imbalance limits my flexibility, creates issues with the temporal management of both Fast Jet and Multi-Crew pilots and perpetuates a turbulent system containing often-significant delays in aircrew development.'

While the services are happy with the quality of the helicopter and fixed-wing pilots it produces, it can take up to four years for a pilot to become operational on a frontline squadron, a huge bite from a young pilot's eleven-year ADF engagement. Some of the delays are caused by fluctuations in demand from the Operational Conversion Units (OCU), but slowing throughput doesn't reduce training costs: maintaining air bases, aircraft and cadres of QFIs is a fixed and very significant expense.

However, it's not clear exactly how expensive it is. It's not clear that the ADF has costed AFTS fully and so developed any expectations for potential savings. A benchmark already exists in the case of BFTS: BAE Systems's contract to provide a complete BFTS service is worth considerably less than $20 million a year. There are significant differences between the two contracts that make a direct comparison difficult. The 100 maintainers had a wider range of maintenance tasks than the BAE Systems maintainers undertook, for example. Nonetheless the company is required to have fourteen aircraft available each day; its fleet logs 18,000 hours each year. It achieves with just twenty-seven CT-4Bs and nineteen maintainers what took the RAAF thirty-seven aircraft and 100 maintainers when BFTS was carried out in-house at East Sale.

So what does the ADF want?
The first thing the ADF wants is more pilots, trained to the same high standard but in less time and to a lower cost per graduate. The most pressing need is twice as many fast jet pilots to fly the F-35; demand for Army and Navy helicopter pilots and RAAF airlift, maritime patrol and *Wedgetail* pilots fleets won't change significantly over the coming few decades.

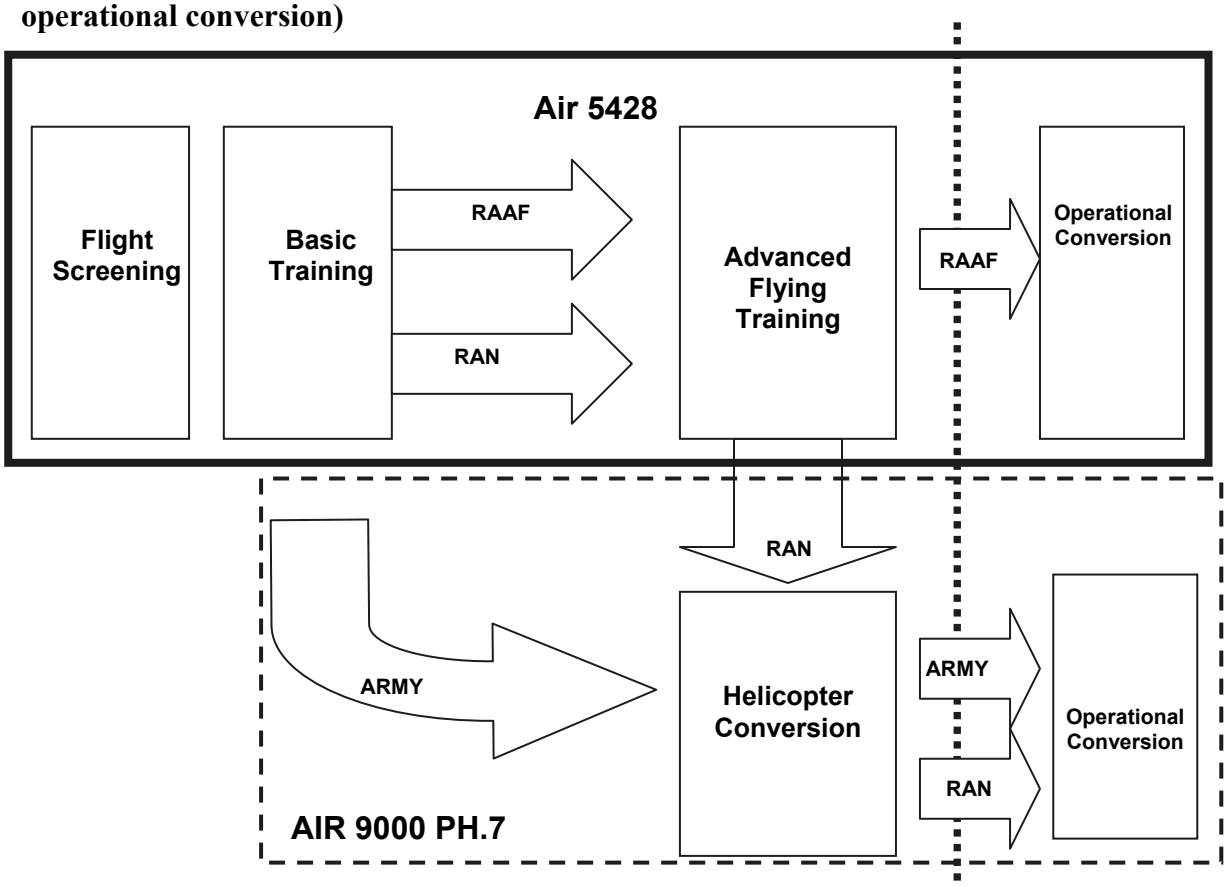
The HATS and PTS projects need to produce 100 pilots a year between them. It's unlikely that this increase—in particular the higher number of fast jet pilots—can be achieved solely by increasing recruitment (using a bigger funnel, in effect). So the system as a whole needs to select candidates more carefully and achieve lower attrition rates during training, while maintaining current standards of flying skill and airmanship.

Part of the problem, according to AM Binskin, is the growing need for different, and higher, cognitive skills in the cockpit. Aircraft are becoming more complex and the pilot selection and training system needs to seek out and strengthen the student's ability to generate and retain situational awareness and process large amounts of operational information.

'As a consequence of these elevated cognitive requirements, recruiting and selection processes must adapt, and move away from the current focus on hand/eye co-ordination towards one which is able to more accurately predict success in the highly networked world of the future', he told The Williams Foundation. This requirement will also have a profound effect on the pilot training syllabus, he warned: 'I anticipate the potential for revolutionary change within the PTS'.

Figure 1 shows how the new Pilot Training System (PTS) will operate, with all ADF pilots undergoing the same BFTS; Army pilots will break off to begin their own rotary wing conversion at Nowra while Navy and RAAF pilots will undergo AFTS. On graduation Navy pilots will undergo rotary wing and then operational conversion at Nowra while RAAF pilots will convert to their own operational types.

Figure 1: The ADF's New Flying Training System (AIR 5428 stops before operational conversion)



Project AIR 9000 Phase 7
Taking AIR 9000 Ph.7 first, the ADF is seeking a training provider who can train Army and Navy helicopter pilots and aircrewmen and Navy AvWOs. This includes rotary wing conversion for the pilots and AvWOs and initial aircrew training for the Aircrewmen. Pilots will then undertake role-specific training: Maritime, Lift or ARH, and then conversion to their operational type.

Defence also wants an Aviation Training Vessel (ATV) with a flight deck of frigate size so that Navy and Army aircrew can learn and practice flight deck operations at a lower cost than using a warship.

The training helicopter needs to be a twin-turbine machine in the 3-tonne weight class with a rescue hoist and a cockpit that's compatible with Night Vision Goggles (NVG). At the time of writing Defence was still awaiting advice from the Department of Infrastructure & Transport on whether the aircraft can be acquired under a Public-Private Partner (PPP, or PFI) agreement, or bought outright by the Commonwealth, or supplied wholly by the contractor.

A draft RFT, which was due out around Easter 2011, will seek innovative proposals from industry bidders. To achieve maximum training value, Defence wants an optimum balance between actual flying and 'synthetic' training using flight simulators, part-task trainers and the like. This is particularly important for the AvWOs because no currently available training helicopter incorporates the sensor and tactical displays they will use on their frontline aircraft. Responses to the draft will refine the final RFT, which is due out in the second or third quarter of the year.

Four teams have declared their hands for AIR 9000 Ph.7. The first is Raytheon Australia teamed with Bell Helicopter Textron, offering the latter's Bell 429 helicopter. The second comprises BAE Systems Australia, simulator manufacturer and training provider CAE Australia, and European manufacturer AgustaWestland, offering the latter's AW109 helicopter.

The third team consists of Lockheed Martin Australia teamed with UK helicopter operator Bristow; this team hasn't named its choice of aircraft as yet. Nor have the fourth team, consisting of Thales Australia and Boeing Australia Ltd: the latter has an unrivalled track record training helicopter aircrew for the Army.

The only other helicopter that is a serious contender is Eurocopter's EC135. Eurocopter itself, through its local subsidiary Australian Aerospace, won't disclose its plans until it has seen the draft RFT—it may bid as a prime or offer its aircraft to another team.

Project AIR 5428
Project AIR 5428 is the bedrock of the ADF's flying training system. Again, a draft RFT due mid- 2011 will be followed by a final RFT later in the year. The entire process is designed to encourage innovative proposals to carry out the full spectrum of basic and advanced fixed-wing flying training, right through to 'wings' standard at 2 FTS.

The winning bidder will be awarded a Performance-Based Contract under which they will probably be responsible for providing (or at least maintaining) the aircraft and synthetic training devices used by the PSA, much as happens today, and will provide the optimum mix of aircraft and synthetic trainers forth both Basic and Advanced training. They will also provide many of the BFTS QFIs, though on current plans all of the Advanced Flying Training QFIs will be from the service; all classroom and simulator instructors are likely to be civilian contractors.

The advanced training system is intended to maintain current standards of pilot skill and airmanship. But the skills required to fly and fight the ADF's increasingly complex, systems-driven aircraft, both single seater and multi-crew, mean the advanced flying training must be flexible enough in both syllabus and training media (including aircraft) to adapt to evolving demand from the frontline Force Element Groups for different skills and new skills mixes.

Advanced training will continue to be based at Pearce (no single base has the sheer capacity or adjacent air space to support an all-through training system), while the RAAF favours East Sale as its basic flying training base. East Sale is also the home of its Officer Training School, Central Flying School (which trains the instructors) and the School of Air Warfare which trains ACOs and AvWOs, so there are training synergies to be captured. Even if another base such as Tamworth is selected, contenders will be directed to also submit a bid based on East Sale.

Navy pilots will continue to follow the RAAF advanced flying training syllabus, for the reasons outlined above; Army pilots will be siphoned off at a point in the BFTS component yet to be determined.

While there's an argument for using a simple, cheap trainer for flight screening and the first few hours of basic training, when the failure rate is highest, several air forces, including the US Navy and Air Force and Canadian Armed Forces, have demonstrated that it's both possible and economical to use a single aircraft type for both basic and advanced flying training. This reduces the cost of training instructors and providing logistics support for different types as well as the training time lost while students convert from one type to another.

It's likely most contenders for AIR 5428 will adopt a similar approach, using a turboprop trainer such as the Hawker Beechcraft T-6C or Pilatus PC-21.

Platform or System?

Only one team has declared itself for AIR 5428: Raytheon Australia has an exclusive partnership with US manufacturer Hawker Beechcraft, offering the latter's T-6C turboprop trainer, with BAE Systems Australia as the third partner.

That exclusive agreement is the potential source of some difficulty for Defence. Only one other aircraft is seen as a credible contender for this contract: Pilatus's turboprop PC-21. Other contenders are believed to be either immature or not yet certified under an airworthiness regime acceptable to Defence. At the time of writing Pilatus didn't plan to form a team to bid for AIR 5428 until it had seen the draft RFT.

This means that several other highly-credentialed training providers, including CAE Australia, Lockheed Martin, Thales and Boeing, will have to fight with each other to win the hand of Pilatus. The resulting team will then bid against Raytheon's team for the AIR 5428 contract.

While this will still likely represent a genuine competition between two credible contenders, some in the training community (both Defence and Industry) fear it focuses attention on the rival platforms rather than rival Pilot Training Systems (PTS).

A PTS is more than just a fleet of aircraft and synthetic trainers. It is an integrated system employing a mix of classroom and synthetic instruction and aircraft to deliver the best training outcome with reasonable value for money. While the choice of training aircraft shapes the PTS to an undeniable degree, it's still only a component of the mix. If the ADF wants to increase the number of pilots graduating from its Pilot Training System it needs a genuine systems approach and can't afford to limit competition and access to good ideas.

Other nations that have run similar competitions have sought to compete the PTS and platform aspects separately, getting the benefits of competition at two different levels.

A number of disgruntled training providers believe Raytheon's exclusive arrangement with Hawker Beechcraft is anti-competitive and works against the best interests of the Commonwealth. They believe Defence should try to seek the best overall PTS, and that competing the aircraft element separately, or requiring all aircraft manufacturers to make their platform available to all PTS contenders, would provide an appropriately levelled playing field for this purpose. However, neither Defence nor (at the time of writing) any of the PTS contenders have shown any sign of challenging Raytheon's arrangement, which has been well known for several years.

Given the age of the training aircraft the ADF is seeking to replace, Defence can't afford the delays associated with re-casting Project AIR 5428 and working up separate tender documents for the PTS and the platform. It's likely that if it tried to do so, or to simply insist that all training aircraft be made available to all training systems bidders, protests (and possibly even litigation) would result in even greater delays. The HATS project suffers a similar imbalance between the number of aircraft and number of credible PTS contenders, but while Raytheon has again sought an exclusive teaming agreement with Bell Helicopter Textron, the AW109 is available to other contenders (though on less favourable terms) and this may be true also of the EC135.

On AIR 5428 Defence will need to trust that market forces can ensure a strong team builds around the PC-21 and that both of the teams responding to the RFT are capable of delivering the quality and quantity of pilots required. For companies that miss out on the opportunity to form or join such a team, Projects AIR 5428 and AIR 9000 Ph.7 could be significant opportunities foregone.

ADF Airlift Capability

Gregor Ferguson

The floods, tropical cyclone, earthquakes and tsunami which devastated Queensland, New Zealand and northern Japan in early 2011 provide a vivid demonstration of the utility of air power and the flexibility of the RAAF's Air Lift Group.

On operations Queensland Flood Assist and Cyclone Yasi Assist alone the RAAF's transport aircraft flew over 410 hours, moving 1,156 residents (including patients and staff of Cairns hospital) and over a 1,000 tonnes of cargo, while the Army's helicopter flew over 930 hours, carrying 1,253 people and 46 tonnes of cargo. In Japan the RAAF deployed 100% of its available C-17 fleet; the aircraft flew 31 sorties carrying 450 tonnes of cargo, including the oversized pumps used to help deal with the damaged Fukushima reactors.

Acknowledging the C-17's sterling performance in these and other military airlift and disaster relief missions over the past two years, the Minister for Defence, Stephen Smith, announced in early March that the RAAF would acquire a fifth C-17A under a US Foreign Military Sales (FMS) agreement worth approximately $300 million. This meant, he said, that the RAAF would no longer need the two additional C-130J *Hercules* it had planned to acquire as part of the rationalisation of its airlift fleet, thus validating the old cliché that 'A good big'un is always better than a good little'un'.

The decision to expand the C-17A fleet and the imminent purchase of a new fleet of Battlefield Airlifters (BFA) to replace the RAAF's *Caribous* will complete what has become a radical reshaping and up-scaling of the ADF's airlift fleet.

The RAAF's airlifters are among the most heavily tasked aircraft in the ADF inventory. They perform a range of transport and combat support functions in Australia, Papua New Guinea and across the globe in support of ADF deployments and disaster relief efforts. When deployed here and overseas the airlifters often work as part of an air transport network, in partnership with Army and coalition partner helicopters.

The reshaping of the airlift fleet has been driven by a number of convergent factors. The first is the increasing size of military loads. Sixty years ago the C-130 *Hercules* could easily carry just about every item of combat equipment an Army might use. That's no longer the case: armoured vehicles and engineering equipment, in particular, have grown in weight and girth. To accommodate them Russia and the US have long operated large airlifters such as the Antonov AN124 and Lockheed C-5 *Galaxy*, but these are heavy aircraft which require long, paved runways. As a result, a new generation of wide-bodied tactical airlifters has emerged, capable of operating from shorter and often unprepared strips.

The best-known Western example is the Boeing C-17A *Globemaster*, of which the RAAF acquired four under an FMS agreement in 2008. The other is the Airbus A400M, which is still undergoing flight testing; it's smaller than the C-17A and powered by turboprops. Once mature, is the most likely candidate to replace the RAAF's remaining *Hercules* in the future, although like many aircraft development programs, cost and schedule overruns have reared their head.

The second convergent factor is time and distance. If the ADF needs to deploy overseas (and even sometimes within Australia), this involves a long journey. The jet-powered C-17A carries equipment and troops at airliner speeds and altitudes, and far more efficiently than the turboprop *Hercules*. In round figures, a single C-17A can carry a 53-tonne load from Australia to the Middle East and return with a back load within 5 days; a single C-130 would take five days just to carry 11 tonnes one-way. The ADF's deployment in the Middle East is supported by a long-haul air bridge employing the C-17A to deliver heavy loads to a transport 'hub' in the operational area, with a detachment of three C-130J *Hercules* carrying smaller loads out along the 'spokes' rather than laboriously flying backwards and forwards from a base in Australia.

The third factor is productivity. The RAAF wants to implement an efficient 'warehouse to warfighter' transport chain. This would see the C-17A carrying outsize loads or crammed with standard military 463L cargo pallets. These pallets are basically flat platforms onto which bags, boxes equipment and even small vehicles can be loaded and strapped down under a cargo net. These would be pre-packed in Australia; at the in-theatre transport 'hub' they would be transferred directly to smaller aircraft such as a C-130 to be flown along the 'spokes' to various Forward Operating Bases (FOB). There they might be transferred in turn to CH-47 *Chinook* helicopters.

The aim is to transfer pallets directly from one aircraft to the next without their contents having to be broken down and re-stowed to fit into a smaller cabin, until the final leg of the journey to the front line aboard a truck or smaller helicopter. If pallets routinely need to be broken down and their contents re-stowed before they can go on another aircraft it means pre-positioning a sizeable movements team at that air base—and this requires a sizeable logistics footprint: equipment and people who need to be paid, fed, trained, prepared and protected while in theatre. The smaller the footprint the better.

Because it can land on shorter, rougher runways than the C-5 and AN124, the C-17A delivers heavy equipment and supplies closer to the front line. The closer the 'hub' is to the front line the shorter the 'spokes' become and the more of them there are. In theatres like Afghanistan road transport is dangerous and slow; aircraft and helicopters provide the best way to get supplies along that 'spoke', depending on the payload and distance to be covered.

While a C-130 can go almost anywhere, it's uneconomical to use one to carry small payloads over short distances. However, using a *Chinook* instead isn't necessarily the answer, either: *Chinooks* cost significantly more to operate per flying hour than equivalent fixed-wing aircraft. So long as suitable runways exist, above a certain range threshold it doesn't make economic sense to use a *Chinook* if a fixed-wing aircraft is available. Below a certain payload/range threshold the C-130 doesn't make economic sense—it's better off elsewhere using its payload/range capability more productively. Therefore, the ADF is radically reshaping its air lift fleet to achieve what it believes is the right mix of heavy (C-17), medium (C-130) and light (BFA) transport.

Ten years ago that fleet consisted of twelve C-130J-30 *Hercules*, twelve slightly smaller C-130Hs and fourteen DHC-4 *Caribous*. Table 1 shows how it is evolving, including the RAAF's now-retired Boeing 707 tankers and the new Airbus A330-derived KC-30A Multi-Role Tanker-Transport (MRTT) which will start entering RAAF service later this year. Although air lift will be a secondary role, the KC-30A's ability to carry 290 passengers and 40 tonnes of cargo at airliner speeds and comfort levels makes it a potent capability when circumstances require.

The most noticeable features are the arrival of the wide-bodied C-17, the shrinkage of the *Hercules* fleet and the introduction of the Battlefield Airlifter (BFA): the RAAF will operate many fewer transport aircraft but these will have a greater range, cruising speed and payload (including volume for outsize cargoes) than was the case at the turn of the century.

Table 1: RAAF Airlift Assets 2001–2016

TYPE	2001	2011	2016
Caribou	14	0	0
KingAir	0	8	0
BFA	0	0	up to 10
C-130H*	12	7	0
C-130J	12	12	12
C-17A	0	4	5
B707	4	0	0
KC-30A	0	0	5
TOTAL	**42**	**31**	**up to 32**

* availability issues mean the RAAF's 12-strong fleet of C-130Hs amounts to only seven aircraft in practice

The RAAF's plan under Project AIR 8000 (which predated the acquisition of the C-17As) was initially to upgrade the ageing C-130Hs or replace them with C-130Js in Phase 1, while Phase 2 would see the replacement of the *Caribou* with the new BFA. Once the C-17A entered service plans changed: the twelve C-130Hs would be replaced with just two J-model aircraft. However, Minister Smith's announcement in March 2011 of the purchase of a fifth C-17A effectively capped the C-130J fleet at twelve aircraft and attention has now turned to the acquisition of a BFA to round out the air lift fleet. The C-130Hs were due to retire in 2013, but their life has been extended to 2016.

Table 2 shows how the fleet numbers translate into useful payload and range. These are very context-dependent: payload affects range, as does the ambient air temperature and altitude of the runway—operating from the 'hot and high' Kandahar, for example, an aircraft will have a lower maximum take-off weight (and therefore either range or payload) than if it were taking off near sea level on a winter's day at Richmond or Amberley.

Table 2: RAAF airlift capabilities

TYPE	Range (km)	Payload (kg)	Fleet Total 2001 (kg)	Fleet Total 2011 (kg)	Fleet Total 2016 (kg)
Caribou#	390	3,830	53,620	0	0
C-130H#	5,100	14,000	168,000	98,000	0
C-130J*	5,100	18,155	217,860	217,860	217,860
C-17A*	4,480	72,500	0	290,000	362,500
KingAir#	3,400	1,600	0	12,800	0
B707#	7,400	23,000	92,000	0	0
KC-30A*	8,000	40,000	0	0	200,000
C-27J*	1,850	10,000[a]	0	0	100,000
C-295*	1,333	9,250	0	0	92,500
TOTAL^	**N/A**	**N/A**	**531,480**	**618,660**	**~ 875,000**

Sources: *manufacturer, #RAAF, ^Depending on which BFA is selected
Notes: Ranges and payloads are representative. For example, the C-27J maximum payload is 11,500 kg with a range of 1,100 km.
'Fleet Total' is aircraft payload multiplied by the number of available aircraft in the fleet

In 2001 the RAAF's air lift fleet would have provided a gross lift capacity of 531,480kg; however, *Caribou* availability was usually questionable. By 2011 the RAAF's airlift capacity had grown to 618,660kg, despite reduced C-130H availability as the aircraft approaches its planned withdrawal date. By 2016, despite losing the twelve C-130Hs and getting only up to ten BFAs with a lower payload, the gross capacity will have climbed again to between 872,860kg and 880,360kg, depending on which BFA is selected.

Battlefield Airlifter

For nearly 40 years the piston-engined *Caribou* was the ADF's 'short haul' work horse, especially in demanding environments such as Papua New Guinea. Its Short Take-Off and Landing (STOL) performance made it unique, but its low speed and payload and lack of protection made it unusable in a modern combat zone. It was never deployed to Iraq or Afghanistan, and was retired in December 2009.

The RAAF now seeks a Battlefield Airlifter that can carry relatively small loads more efficiently and economically (and safely) in a war zone. This will be acquired under Project AIR 8000 Ph.2 at an estimated cost of $1.5 billion and should enter service from about 2015; 1st Pass Approval for this phase is scheduled for the 2011–12 financial year.

The BFA must be able to carry the same 463L pallets as the *Chinook*, C-130 and C-17A, though obviously not the same number. The ADF also wants it to carry a variety of vehicles, including the Protected Mobility Vehicle (Light), or PMVL, being acquired under Project LAND 121 Ph.4, and the smaller trucks and Mercedes-Benz G-*Wagens* being acquired under Phase 3.

The BFA must also be able to carry some specialised payloads (exact nature undisclosed) on behalf of the Special Forces, including Long Range Patrol Vehicles and boats. Furthermore, the RAAF wants to be able to take such an aircraft into a high-threat area such as Afghanistan which means it must be fitted with Electronic Warfare Self-Protection (EWSP) equipment, and possibly also with features such as armour and fuel tank fire suppression systems.

This all means an aircraft with a large, spacious cabin and robust performance, especially on the hot and often high runways in our region and further afield.

Project AIR 8000 Ph.2 is a re-run of the old Project AIR 5190 which was abandoned for budgetary reasons in mid-2000 after competitive tenders had been assessed and a choice of aircraft had been made. Defence faces exactly the same choice today, between the Airbus Military C295 and Alenia's C-27J *Spartan*, which may be acquired directly on a commercial basis or under a Foreign Military Sales agreement from the US Government—the USAF has also ordered the C-27J.

The C295 can accommodate five 463L pallets while the C-27J can accommodate three, plus an HCU-12 'half-pallet', but has a stronger floor to handle high density loads and a broader, higher cabin which allows for a greater pallet volume than the C295. The C295 is believed to have won the battle in 2000, but it's not clear the current contest will be fought on the same ground—comparing requirements then and now it seems Defence wants more payload flexibility in a higher threat environment from its BFA today than was the case in 2000.

This is consistent with a trend towards airlifters with wider and higher cabins to accommodate bulkier military loads. This has driven the RAAF to acquire the C-17A and when it becomes time to consider the C-130 *Hercules* replacement, perhaps in fifteen years or so, the only credible contender may be the Airbus Military A400M, which has a cabin 4m wide and 4m high.

There's a strong feeling within industry that Defence's stated requirements favour the C-27J, although it is believed to be more expensive. Airbus Military has said it will only submit a tender for AIR 8000 Ph.2 if it feels Defence is running a *genuine* competition. If it declines to bid, the DMO may be left with a single aircraft option—the C-27J—with the only choice being between procurement methods.

Uncertain steps towards an amphibious capability

Tom Muir

The Commodore and the Colonel worked on their plan of campaign; the staff officers worked on their lists; the soldiers polished their buttons, formed in squares, formed in fours, and marched off by the right into the boats, filling the transports and the frigates…

Patrick O'Brien
The Mauritius Command

While the concept of an amphibious capability as a major force projection component of the future ADF has been broadly embraced, even prior to the 2009 White Paper's maritime strategy imperative, thus far its implementation has been problematic.

At present the ADF's capability for land force maritime manoeuvre is little more than parlous, with sealift now limited to one 8500t amphibious transport (LPA) not available until mid-2012, one 5800t heavy landing ship (LSH) with known mechanical problems, six 316t heavy landing craft (LCH) and fifteen landing craft mechanised (LCM8) of which eight are operational at any time.

In a scathing address to the *Australian Defence Magazine* Congress in February, Defence Minister Stephen Smith said he had called for a report from the Secretary of Defence and the Chief of the Defence Force as to why three of the Navy's biggest ships, HMAS *Manoora*, HMAS *Kanimbla* and HMAS *Tobruk*, were out of action when the government wanted them to help out in the aftermath of Cyclone Yasi. He said their advice was a frank appraisal identifying systemic and cultural problems in the maintenance of the ship fleet for a decade or more. It outlined the side effects of a can-do and make-do culture and a lack of sufficient adherence to verification, certification and assurance processes.

As a result he announced that the government had appointed an independent team of experts, headed by businessman Paul Rizzo, to help implement essential change in the management and repair of ships. He said it was essential that the problems outlined in the advice were addressed as a matter of priority ahead of the transition to the new Landing Helicopter Dock (LHD) ships.

This work would be additional to the new comprehensive transition plan Defence had been asked to prepare to ensure a smooth transition to the introduction of the LHD ships in the middle of the decade. This plan could include the lease or purchase of ships that would provide a platform to train and prepare for the LHDs, such as a *Bay* class ship from the UK. He added that if this option was taken up, it could provide for the decommissioning of HMAS *Kanimbla* or HMAS *Tobruk* to be brought forward. Having earlier held discussions with Defence Secretary Liam Fox on the subject, Defence Minister Smith announced on 17 March that a formal bid to purchase the ex-RN ship *Largs Bay*, a Landing Ship Dock (LSD) based on the Dutch *Enforcer* design, had been made. Australia's approach which subsequently approved by the British Government. So the RAN's interim capability should see *Kanimbla* back in service in 12 months or so, now joined by the 16,000t *Largs Bay*, possibly available for RAN service at that time.

This interim capability, augmented by a small flotilla of LCHs and LCMs (and with a later announcement that a fast catamaran like the Tasmanian-built *Jervis Bay* that served with the RAN from 1999–2004 would also be sought), should prove useful for working up systems and crews for the introduction of the *Canberra* class LHD, but as a truly amphibious capability there remain shortfalls in lift capacity, manoeuvre, airlift and C4I that will not be fully rectified until LHD 1 reaches full operational capability in 2017.

JP 2027's money spin

So how did this sorry situation begin? The problems started with the opportunistic acquisition of two ex-US Navy amphibious ships that brought to light management shortfalls by Navy in their procurement and support that raised the ire of two Defence Ministers, John Moore in 1999 and Stephen Smith this year.

In December 1993, the acquisition of two ships of the *Newport* LST class was approved under Phase 1 of JP 2027 at a cost of $70m, the intention being to modify them for their ADF role. This was to occur under JP 2027 Phase 2 for which $55m was approved although neither detailed operational requirement nor their concept of operations had been finalised. In deciding to purchase the LSTs the emphasis was

placed on timing and availability of vessels rather than meeting anything other than a general requirement.

Following limited inspections by a RAN technical team suggesting that a further twenty years of life could be reasonably expected, and ‘satisfactory’ sea trials conducted by the US Navy, the ships were purchased 'as is' in August 1994.

Shortly after their arrival, a detailed hull inspection of the newly commissioned ships *Kanimbla* and *Manoora*, revealed extensive corrosion necessitating expenditure of $31m by Navy on repair work before the vessels actually underwent their Phase 2 modifications. And the proposed modification work was extensive. It included removal of the bow doors, derrick, and tank ramp, the installation of a four-helicopter hangar, a 70t crane for loading LCM8 watercraft, installation of a stern door, accommodation for 650 personnel, and a medical facility.

These and other tasks came in the form of work packages but it was soon apparent that not all the work packages could be accommodated within the approved cost and some were deferred until a later refit.

After lengthy contract negotiations Forgacs Engineering of Newcastle was awarded a $55m contract to undertake a capability upgrade package, a limited refit of one ship with the prospect of this latter activity needing to be expanded. But along with Defence, Forgacs had little comprehension of the ultimate scope of the refit package and their capacity to keep up with proposed design changes and the sequential release of work packages by Defence.

And the costs kept mounting. By December 1996 the Navy’s liabilities had risen to $105m but a year later further Navy funds were required for the repair and set to work of systems that had been idle for a considerable time. If this wasn’t enough, during 1998 and early 1999, more required repair work was discovered during the modification process, jeopardising the reliability of the ships if not rectified. By September 1999, when the modification process was well advanced, approved funding for all LPA related work had grown to $340m. But that was not the end of it—additional funds of $35m were then required to complete known and anticipated repair and refit work for the ships, as a result of a Lloyds certification survey and OHS issues.

Finally, Forgacs claimed they had incurred increased project management costs and additional overheads not reasonably provided for in the original contract and submitted claims seeking additional payments from the Commonwealth. Thus the original estimate for the purchase and modification of the two LPAs had grown from $125m to more than $400m by the time the two ships were accepted into service in 2000-2001. In addition to this three-fold plus increase in cost, there was a delivery delay of twenty-six months for the first ship, *Manoora*, and thirty-five months for *Kanimbla*.

The damning report on the overspend, demanded of the Chief of Navy by the Defence Minister John Moore, found a vast underestimation of the material condition of the ships on purchase and the repair and refit work required. There was also poor management of the LPA project with unacceptable management of the repair and refit

component. The report said inadequate control of work and poor estimates of what was required made a major contribution to the cost and schedule overruns.

LPA Amphibious Watercraft

Unfortunately the acquisition of new watercraft to operate with the LPAs was as problematic. A new project, JP 2048 Amphibious Deployment and Sustainment (ADAS) was raised to meet an increased priority for sealift capability (for humanitarian as well as military operations). Phase 1A was approved in 1997 to introduce a new amphibious watercraft system that would enable a Battle Group size force to be discharged from the LPAs significantly faster than if the in service LCM8s were used.

Two watercraft were to be stowed on the foredeck of each LPA (modified for this purpose) when deployed for operations. Upon arrival in the AO the craft would be lowered into the water via the crane when they would receive cargo via the stern door of the LPA or from the crane. The watercraft would then transport personnel, vehicles and equipment from ship to shore.

In July 2002 ADI was awarded a $32m contract to build six amphibious watercraft to their innovative design which provided for faster load and discharge of vehicles and personnel either in independent operations or as part of an integrated system. Powered by twin water jets and carrying some seventy tonnes at up to 14 knots, the twenty-four metre watercraft represented a substantial capability improvement over the ageing LCM8 they were to replace.

Following finals systems acceptance from the Commonwealth, all six watercraft were delivered to the Army in Townsville in 2005, but when final trials were conducted it became apparent that, due to their width, only one watercraft could be carried at any time, not the two required for completing their primary mission.

And while the Army made some use of the watercraft for training, despite rectification of faults, including aluminium cracking, they were not adopted for their secondary mission of independent operations, and the vessels have languished on cement blocks in the Rosshaven yard at Townsville.

That the LCM2000 turned out to be too wide for personnel to safely pass when two were in position was an extraordinary error in design as was its acceptance by the Defence Materiel Organisation and a statement that it ‘was very pleased with the outcome of the LPA Amphibious Watercraft project.’

On 1 February 2011 Defence Minister Stephen Smith and Defence Materiel Minister Jason Clare announced the cancellation of the LCM2000 Watercraft project (and thereby a loss to the taxpayer of $40m).

JP 2048’s shining promise

Despite Phase 1A’s abysmal result, Joint Project 2048 remains the key to the achievement of an amphibious system that should aspire to provide a Battle Group lift capacity including:

- carriage of approximately 2,000 personnel in addition to crew, approximately 2,400 lane meters of vehicles (approximately 100 A vehicles—depending on the solutions selected for LAND 17 and LAND 400—and 260 other vehicles and trailers)
- supplies to support the force
- ability to deliver amphibiously the battle group and its equipment in both permissive and non-permissive environments
- ability to airlift simultaneously an air mobile combat team of up to 220 personnel and one combat team by sea to a different objective
- C4I appropriate to command a formation size coalition / combined / joint task force.

JP 2048 Phase 1B was for the overhaul of the six *Balikpapan* class Heavy Landing Craft (LCH), extending their life of type by eight years. Now completed, the contract was awarded to Tropical Reef Shipyard, which retains a maintenance contract for their scheduled refit and docking.

New Amphibious Assault Ships

With Phase 4A/B focused on just two LHD designs, the Spanish 27,000t BPE and the French 22,000t *Mistral*, in 2004 Defence released a request for information (RFI) to their respective overseas shipbuilders, Navantia and Armaris. Both were subsequently awarded risk reduction studies to provide the technical data for estimating costs for ship construction in Australia.

After this exhaustive process an RFT was released to Australian shipbuilders in May 2006 inviting tenders for either or both of the designs. Navantia teamed with Tenix (now BAE Systems Australia) and Armaris with ADI (now Thales Australia). On 20 June 2007 it was announced that Navantia and its Australian partner, would supply the Navy's two LHDs.

Under the contract, the hulls for the two Australian LHDs are being built by Navantia at El Ferrol, but their superstructure is being built by BAE Systems at its Williamstown yard. The hull of the first ship (*Canberra*) was launched in February 2011 when the keel of the second ship (*Adelaide*) was laid.

BAES will also fit out the ships and install their command and control systems, an activity worth about $500 million. Their combat systems will be developed and integrated in Adelaide by Saab Systems Pty Ltd under a contract worth an estimated $100 million. The first hull is due to arrive in Melbourne in August 2012 and both ships will be delivered between 2014 and 2015 for an anticipated cost of some $3 billion.

LHD Amphibious Watercraft

In 2009 it was announced that first pass approval had been granted for the Phase 3 acquisition of a new breed of amphibious watercraft. These would integrate with the platform chosen in Ph4A/4B and be able to transport personnel and equipment from large amphibious ships to shore without the use of fixed port facilities or prepared landing facilities.

In response to a request for proposal (RFP), Navantia offered their LCM-1E, a 110-tonne class fast landing craft designed and built by Navantia for the Spanish Navy's BPE. French shipbuilder CNIM proposed their L-CAT.

In the event it was decided to proceed with Navantia's LCM-1E proposal, which was designed for interoperability with the *Canberra* class LHDs, and accordingly a sole-source request for tender (RFT) was issued to Navantia in May 2009. The RFT sought a prime contract for the design and build of 10 or 12 LCM-1E with one of the following three options:

- Option 1: 10 or 12 LCM-1E built in Spain
- Option 2: four LCM-1E built in Spain, six or eight LCM-1E built in Australia
- Option 3: 10 or 12 LCM-1E built in Australia.

Defence has yet to indicate which option is preferred, a situation that is likely to continue until mid-2012 at the earliest.

New Heavy Landing Craft

The *Balikpapan* class LCHs, which underwent life extension refits under a mid-1999 contract with Tropical Reef are to be replaced and to that end in January 2011 Defence released a Request for Information (RFI), seeking proposals from industry for new Heavy Landing Craft under JP 2048 Phase 5.

According to the DCP, Phase 5 will acquire six new heavy landing craft with improved ocean-going capabilities able to transport armoured vehicles, trucks, stores and people. It will provide a capability to conduct independent small scale regional amphibious operations or to support the *Canberra* class as part of an Amphibious Task Group.

Through the RFI process, Defence is hoping for innovative solutions and options to satisfy the Phase 5 capability requirement together with indicative costing and schedule information to enable assessment of their relative merits and feasibility. However, it would seem that Defence is in no hurry to replace the present LCHs, all six of which were commissioned during 1973-74 and are thus approaching forty years in service. First Pass approval is anticipated between 2012-13 and 2014-15 and Year of Decision sometime in the period 2015-16 and 2017-18, with a planned initial operating capability beyond 2019.

Strategic Sealift Ship

Phase 4C is for a large strategic sealift ship to move stores, equipment and personnel. Based on a proven design, the new ship will have a displacement of 10 000 – 15 000t, with landing spots for a number of helicopters and an ability to land vehicles and other cargo without requiring port infrastructure. The new ship will provide ongoing sustainment support for deployed forces.

With the acquisition of the *Bay* class amphibious ship it is possible that this could become the de facto Phase 4C capability. Early introduction would help fill the immediate gap left by *Kanimbla's* lengthy docking for repairs and the decommissioning of *Manoora* and provide an excellent training platform for transition to the new LPDs. The *Bay* class vessel is similar to the Dutch HNLMS

Rotterdam (L800) and Spanish SPS Galicia (L51) LPDs, and would appear to be a close fit to the 4C requirement.

If acquired, when joined by the new *Canberra* class LPDs in 2015, the RAN would have an imposing amphibious fleet of three LPDs, their watercraft and the impending introduction of six new heavy landing craft.

JP 2048 Phase 4A/B Project Budget
Of total approved project expenditure of $3131m, cumulative expenditure to June 2010 was $1011m and estimated expenditure for 2010–11 is $501m.

Air Warfare Destroyer

Gregor Ferguson

Project SEA 4000 Air Warfare Destroyer is entering the toughest part of the program, with construction of hull and superstructure blocks under way and integration of the various combat system elements about to start. Visible signs of progress are due in July when the first hull blocks are expected to be delivered from BAE Systems' yard at Williamstown to the South Australian government-owned Common User Facility at Osborne, SA, where shipbuilder ASC will start to assemble the first of class, the future HMAS *Hobart*.

The three *Hobart*-class DDGs being procured under Project SEA 4000 are due to enter service from 2014 at a project cost of some $8 billion, and will be the most powerful warships ever operated by the ADF. Provisional Acceptance of *Hobart* is due in December 2014, followed by her sister ships *Brisbane* in March 2016 and *Sydney* in June 2017.

Displacing some 7,000 tonnes each, the DDGs will be equipped with the Lockheed Martin *Aegis* Weapon System, including the SPY-1D(V) Phased Array Radar, and will be armed with the latest version of the US Navy's *Standard Missile* family, the SM-2, providing long range air defence out to a range of 150km. This will provide a protective 'bubble' for entire task groups that also extends below the surface as the AWDs will carry an anti-submarine helicopter and advanced sonar systems as well as anti-submarine torpedoes.

They will also be fitted with *Harpoon* missiles for Anti-Surface Warfare (ASuW) as well as the US Navy's Cooperative Engagement Capability (CEC), which enables a ship to use its SPY-1 radar to track and designate targets for a missile fired by another ship. This is an important enabler for fleet air Defence.

The Australian Government is still considering adding to the DDG an anti-ballistic missile capability to the DDGs at some point in the future and/or the more capable SM-6 air defence missile. The ships' Mk41 launchers can accommodate the anti-ballistic missile SM-3, although the *Aegis* system would require an upgrade to accommodate that capability

The three *Hobart*-class ships are being built by the AWD Alliance, located adjacent to the Osborne yard near Adelaide. This consists of shipbuilder ASC, The Defence Materiel Organisation (DMO) and Raytheon Australia, which is the Combat System

Systems Engineer (CSSE) responsible for integrating the ship's combat system. This in turn consists of the *Aegis* Weapon System—the US Navy's latest Baseline 7.1, COTS refresh 2—to which will be added a range of sensors and equipment unique to the *Hobart*-class ships. These will connect to the *Aegis* system through a custom 'portal', the Australian Tactical Interface (ATI), developed by Norwegian firm Kongsberg, who have provided similar *Aegis* interfaces for Norway and South Korea.

The *Hobart*-class design is based on the latest version of the Spanish Navy's F100 class of frigates, designed and built by Spanish yard Navantia. The actual design basis is the F105, the first of the so-called second flight of these ships, including modifications developed subsequently, such as more powerful diesel engines, increased fuel capacity for greater range and a bow thruster to improve manoeuvrability when docking. To these are added further changes to 'Australianise' the design; the latest *Aegis* hardware and software incorporating the CEC, an all-new sonar and torpedo defence system, an all-new Electronic Warfare (EW) system, the latest version of the US Mk45 5-inch gun (with an extended barrel and minor magazine changes to accommodate Extended Range Munitions expected to be procured in the future) and replacement of the existing surface search radar with an improved horizon search radar, the AN/SPQ-9B, which the US Navy also fits to its *Ticonderoga*-class *Aegis* cruisers.

While these changes are relatively minor, on complex platforms like warships even a seemingly small change can create a ripple effect impacting on other parts of the ship.

Combat System

In Australian defence projects, large, complex and software dependent equipment such as a ship or submarine combat system are normally the source of the greatest risk and the majority of problems. To ensure this wasn't the case on the AWD project the government made an early strategic decision that the AWD would be equipped with a very similar *Aegis* Weapon System as the US Navy's DDG-51 destroyers. (Changes are required to take account of the change from ninety-six missile cells to forty-eight and from three fire control directors to two.) This consists of the SPY-1 radar, Mk 41 vertical missile launcher system and combat system computers, consoles and displays. Two of Australia's three 'ship sets' of *Aegis* equipment have been built already by Lockheed Martin and tested successfully at the company's Moorestown, New Jersey, test site.

The other components of the combat system communicate with the *Aegis* core via the ATI, a secure software application which passes data such as sonar target tracks and EW information to the *Aegis* mission system where it is integrated with the radar data and displayed as part of the integrated tactical picture. Apart from internal and external communications system, most of the ship's systems have been selected and ordered: satellite communications, Infra Red Search & Track (IRST) system, *Nulka* active offboard decoy, EW system, horizon search radar, sonar, torpedo defence system, Very Short Range Air and Surface Defence system and so on. The integration process is already under way using high-fidelity emulators to test and refine the interfaces between these, the ATI and the *Aegis* system.

The ATI's interface with *Aegis* has been verified at Moorestown, using an emulator linked to the real *Aegis* hardware and software, and in Sydney where the real ATI hardware and software is linked to a high-fidelity *Aegis* emulator.

This combat system architecture allows Australia to develop and evolve the AWD combat system in the future, including changing the non-*Aegis* equipment if necessary, without having to touch the *Aegis* core which will remain aligned to the US Navy's own system. It means a reduced software develop and integration task, especially if proven off-the-shelf equipment is selected as has generally been the case—although the sonar suite, supplied by Ultra Electronics, and the ITT-designed Electronic warfare system haven't been integrated in the *Aegis* Weapon System configuration before.

The US International Trade in Arms Regulations (ITAR) prescribes a somewhat cumbersome security regime; integration of some ITAR-controlled items of US origin can only be done in approved facilities. For the RAN this work is being done by Raytheon Australia at the Land Based Integration Facility in North Ryde, Sydney, which is also acting as the test site for the combat system.

While shore-based integration retires much of the technical risk there is a residual integration risk once these items are installed on the ship. As the RAN's upgrade of its FFG frigates showed, EW systems in particular are extremely sensitive to interference from other ship equipment and these problems don't emerge until they are tested for real. Diagnosing and solving such problems can be a slow and frustrating business.

Ship ahoy

Each ship itself is built from thirty-one hull and superstructure modules, or 'blocks', prefabricated on-site at ASC, and by BAE Systems in Williamstown and Forgacs Engineering in Newcastle. The modules built in Newcastle and Williamstown will be transferred to Osborne by barge for consolidation.

ASC itself is taking responsibility for the critical central section, known as the *Aegis* 'tower', which contains the radar antennas, transmitters and receivers and the wave guides running between them, along with the ship's command centre. Specialists from Lockheed Martin and Navantia are on hand to assist: the 'tower' on Australia's ships is identical to that of the Spanish F105 destroyer, SPS *Cristobal Colon*, and which was launched last year.

BAE Systems was originally responsible for twelve of the blocks, including the seven critical keel blocks on which much of the ship's machinery and engines are installed, while Forgacs was responsible for ten blocks on each ship.

The AWD Alliance had originally selected NQEA in Cairns, rather than BAE Systems, to fabricate blocks, in spite of its small workforce and the fact that BAE Systems in Williamstown had built the ten *Anzac* frigates for Australia and New Zealand through the 1990s and early 2000s. In the event, NQEA couldn't raise the finance and resources to do this and its work was awarded instead to BAE Systems.

However, it was widely reported in late-2010 that BAE Systems had encountered significant weld quality and heat distortion problems with its first block, number 107.

While the AWD Alliance put its best possible face on the problem, the reality was ugly. Block 107 is one of the most complex of the keel blocks, requiring the heavy steel plate of the ship's bottom to be curved and shaped very precisely. It includes the ship's stabilisers and their operating mechanisms and part of the longitudinal stabilising strakes, and its 20m x 20m flat upper deck also supports one of the ship's two propulsion diesels, one of its LM2500 gas turbines, one of its gearboxes and one of its propeller shafts. Tolerances are very tight and the technical difficulty is compounded because Block 107 also contains some 2,000 pipes, ducts and vents for electrical cables, air conditioning and fuel, water and sewage.

The weld quality on Block 107 was found to be poor; just as bad, heat distortion had buckled the flat deck plating out of tolerance. A significant amount of re-work is necessary which has delayed delivery of the first blocks from Williamstown.

This problem highlights two issues: first, the ship is being built in a slightly different way—at Navantia the F-100s are assembled on an inclined slipway and then launched before internal fit-out is complete, whereas at Osborne they will be assembled on a flat hardstanding. This is the easiest and cheapest way to install piping, wiring, even machinery, and presents the easiest time to effect repairs. Doing it after the modules are assembled increases the cost by a factor of five; doing it once the ships are in the water raises the cost by a factor of ten.

But it does require the block manufacturers to stick to their schedule and build to the required level of accuracy so that pre-outfitted blocks and their wiring and piping are delivered in the right sequence and fit together properly. Which raises the second issue: the Williamstown yard became highly proficient at doing this during the *Anzac* frigate program; since then the work force has been run down due to lack of work and BAE Systems had to recruit and train a new workforce of welders and supervisors for the DDG.

The production difficulties have been compounded by data issues with the engineering drawings from which the blocks are fabricated. Navantia is delivering some 10,000 drawings that are essentially identical to those used by Navantia themselves. While Navantia's design and engineering processes are excellent, like many industrial processes shipbuilding relies on human knowledge and experience and the drawings haven't always conveyed the subtle expertise and 'tricks of the trade' that Navantia's workforce has developed building the F-100 family at its Ferrol yard—this is a recurring issue with most technology transfer regimes. The AWD Alliance reports these issues are being resolved. An independent review team checks drawings before they are released and the Alliance has negotiated controlled access to Navantia's original CAD files to conduct early interference and fit checks before cutting metal.

Meanwhile, to reduce pressure on BAE Systems, three of the blocks they were supposed to build for each ship will now be built by Forgacs—the bow and two stern sections. The first keel block from Williamstown is due at Osborne in July, with deliveries from Forgacs due by the end of the year; consolidation into a complete ship will start early in 2012.

This represents a potential schedule slippage: the original build plan would have seen the first blocks delivered in early 2010, but delays in selecting the block fabricators, and then negotiating first with NQEA and then BAE Systems, ate into the schedule. Nevertheless, the AWD Alliance had built a significant cost and schedule buffer into its program—at one point in 2009 it was about four months ahead of where it needed to be. But the block fabrication difficulties have eroded this buffer and the Project Contractual Schedule is now under pressure. Forgacs is also climbing its own learning curve and, lacking Williamstown's expertise, was allocated slightly simpler blocks to fabricate.

However, productivity is rising as the three companies introduce improved lean manufacturing processes. And 'learning curve' effects will bring their own cost and manufacturing efficiencies.

Progress

The approved project budget is $7.996 billion, of which some $2.6 billion has been spent. Calculated on an earned value basis the AWD Alliance says the project is now one third complete.

Money spent to date includes around $1 billion for the three *Aegis* Weapon System and design fees to Navantia which is carrying out the platform design under a sub-contract from the AWD Alliance.

The AWD Alliance has been careful not to state a launch date as yet. It wants to keep the ships on the hardstanding for as long as possible prior to launch in order to keep fit-out costs down. The workforces at ASC and BAE Systems are climbing a steep learning curve from what one senior Alliance source described as a 'cold start'. The widely publicised difficulties at Williamstown saw significant management changes within BAE Systems and the concentration of technical, managerial and supervisory resources by its UK parent company as well as Navantia. ASC has been grappling with the same technical challenges and learning from the Williamstown experience. Interestingly, the Newcastle/Hunter River region has managed to avoid many of the demographic challenges which have siphoned highly skilled workers away from the defence and naval industries; Forgacs, which has had a relatively stable workload over the past few years, has benefited as a result with a stable, skilled workforce and sufficient yard capacity to handle more work, if asked.

The AWD project is a complex construct with many moving parts. It is starting to come under significant pressure, as all big, complex projects do when they move deep into the implementation phase. This is the point at which weaknesses of inception or implementation are likely to emerge and at which panicky observers might misinterpret passing difficulties as fatal weaknesses. This could be just as dangerous to the project as mistaking major problems for transient difficulties and could have the extremely undesirable side effect of driving the various players into entrenched, defensive commercial positions, which fatally impede a constructive resolution of genuine issues and problems. It's possible that the difficulties at Williamstown have served as a 'tripwire', preventing complacency and ensuring ongoing management vigilance. It's also certain that this phase of the project is generating important lessons that Defence as well as industry must apply to future naval construction programs.

One of the most important is ensuring continuity of demand to maintain the quality and currency of skills required to build submarines and ships in the future.

Enhanced force protection measures

Tom Muir

In July 2009, following a visit to Afghanistan, where he would have learned at first hand of complaints over shortfalls and the quality of their equipment, and concerned at the growing number of ADF servicemen killed and injured from Improvised Explosive Devices (IEDs) and indiscriminate rocket and other attacks, the then Minister for Defence, Senator John Faulkner sought a review of force protection measures available for Australian combat personnel.

Conducted at the most senior levels of Defence, the review included discussions with troops in theatre about their force protection needs and an assessment of the effectiveness of previous and current force protection initiatives. This resulted in a series of recommendations for enhanced protection measures, especially reflecting the escalating incidence of IED and rocket attacks in Oruzgan Province.

A year later it was announced that some measures including improved counter-IED capabilities had already been implemented, and the progressing of other recommendations was well underway, including enhanced medical support, and the upgrading and hardening of living and working accommodation in Tarin Kowt.

There are a number of genuinely new initiatives, whereas others are based on projects that are already underway or are being fast tracked to meet current contingencies. Most are generally aimed at providing direct protection to Australian troops from small arms, improvised explosive devices and indirect fire, as well as improving intelligence and surveillance capabilities. They cover a variety of active and passive measures, which range from personal protective equipment for our soldiers, to unmanned surveillance systems and medical support.

Force element groups in the Afghanistan theatre are benefiting from these enhancements. Among the beneficiaries is the Special Operations Task Group (SOTG), who have gained improved weapons, up-armoured and up-armed vehicles equipped with new communications systems and counter-IED jammers. The SOTG is also getting body armour systems to meet special requirements.

The various measures are listed below in their different costed groups, with descriptions of the systems or capabilities involved.

Counter IED ($11.9 million)
Under this heading Defence has grouped improved route clearance, electronic countermeasures, additional military working dogs, counter-IED training, exploitation analysis and targeting and a forensic analysis capability.

For route clearance tasks for the conduct of operations the ADF has procured a number of Self-Protection Adaptive Roller Kits (SPARK roller) to mitigate the risk to

vehicle mounted troops from IEDs. Attached to the front, SPARK rolls ahead of the vehicle, causing IEDs to detonate on the roller. This forces as much of the blast as possible down and away from, as opposed to underneath, the vehicle. This greatly reduces the risk of injury or trauma to the crew and battle damage to the vehicle.

Explosive Detection Dogs (EDDs) are used to locate and identify potential IEDs, explosive hides and other areas of interest. Additional military working dogs are training for counter-IED work. All Services will receive IED training.

Also within this counter-IED group are a number of other classified force protection measures including ECM improvements, data analysis and targeting and a forensic analysis capability.

Protection against Indirect Fire ($393.6 million)
With rocket attacks continuing against ADF personnel at their base at Tarin Kowt, Defence has invested in a Counter-Rocket, Artillery and Mortar (C-RAM) system to provide a capability that can detect and track these projectiles in flight and warn forces of incoming threats.

The C-RAM system, now introduced, comprises of a leased *Giraffe* Agile Multi-Beam radar, a number of United States sourced AN/TPQ-48 Lightweight Counter Mortar Radars (LCMR), personnel warning equipment (sirens and strobe lights) and networking command and control equipment. The radars detect projectiles in flight and the C-RAM system can then issue a warning to troops within the predicted impact danger area so that they can take protective actions. This dramatically reduces their risk of injury.

The leased *Giraffe* radar is a light armoured vehicle variant and will be replaced in Afghanistan in 2012 by two of three *Giraffe* truck mounted systems being acquired by the Commonwealth under an $86 million contract signed with Saab in Dec 10. The third *Giraffe* truck mounted system will also be delivered in 2012 and will be used as an Australian-based training and support capability. The *Giraffe* radar rotates through 360 degrees and can operate up to twenty-four hours a day. The LCMR includes similar such functionality.

The C-RAM system was operational at Tarin Kot in December 2010, five months ahead of schedule, and has been providing early warning against indirect fire attacks. Further C-RAM system increments are now being progressively deployed to Afghanistan, with subsequent progressive delivery of improved levels of protection expected through 2011.

Increased Armour and Fire Power for Vehicles ($271.5 million)
Enhancements to the survivability and lethality of the Protected Mobility Vehicles (PMVs) and ASLAVs will cost $271.5 million. Australian *Bushmaster* PMVs are increasingly used by the Special Operations Tactical Group (SOTG) and a number are being equipped with .50 cal heavy machine guns on their EOS remote weapon stations in place of the FN 7.62 mm machine gun.

As required, PMVs are equipped with CREW electronic-jammers designed to prevent the initiation of radio-controlled IEDs. In addition to the systems in operation in

Oruzgan, another 265 CREW systems are being acquired as spares to be despatched as priorities dictate.

An upgrade for the ASLAV fleet is planned under Project LAND 112 Phase 4. To meet the range of threats, primarily from IEDs, interim survivability enhancements for deployed ASLAV have been developed. Government is awaiting options to be provided by Defence following technical investigations being conducted into the solutions put forward by industry.

Enhanced Intelligence Surveillance Reconnaissance ($740 million)
This section describes efforts to achieve an increased rate of effort (RoE) of ISR assets in theatre, other intelligence related capabilities and a range of classified ISR enhancements. The total cost of ISR capabilities included in the Force Protection Review is $740 million, comprising $370.9 million for increased RoE for ISR, and $370 million for nine intelligence related capabilities.

Increased ISR rate of effort is being provided by a third airframe at the RAAF *Heron* Unmanned Aerial Vehicle detachment at Kandahar in Afghanistan. The fourth rotation of the RPA detachment has set a unit record for 475 monthly flying hours during April 2010. Working closely with coalition ground forces, the *Heron* system provides high quality situational awareness to ground forces through remote viewing terminals, such as the L3 ROVER systems, which provide video imagery from UAVs and AP-3Cs equipped with tactical data links.

New capabilities and enhancements include the acquisition (under Project JP129 Tactical UAV System) made up of ten operational aircraft and eight attrition aircraft, and supporting equipment including ground control stations, viewing terminals and vehicles. These will eventually replace the *ScanEagle* surveillance service now provided commercially by Boeing subsidiary Insitu Pacific. Improved dissemination will ensure that intelligence travels quickly and directly to operational commanders, providing them with clear and concise situational awareness.

Enhanced Electronic Countermeasures ($188.4 million)
This group comprises a number of classified Electronic Countermeasures upgrades and capability acquisitions for which there is additional funding of $188.4 million.

Soldier Health ($8.3 million)
This includes the following six measures to provide better health protection for deployed forces:

- Hearing protection to facilitate noise reduction. This initiative was to include hearing protection and suppressors for weapons. After consideration by Army HQ, this initiative was dropped from the FPR.
- Implementation of a buddy system for mental health identification at a cost of $1.9 million.
- Trialling of a decompression program to help assist in soldier's adjusting from operations to being back home. This will cost $1.8 million.
- Establishment of a combat medical advanced skills training (CMAST) facility within Australia. This will cost $4.1 million and will be up and running by 2012.
- Hearing Tests will be incorporated into post deployment medical checks. Defence will absorb this cost.

- This initiative is also looking at providing additional combat medics for infantry platoons. Defence will absorb this cost.

Enhanced Personal Equipment and Preparation ($55.6 million)
A comprehensive package of measures to enhance the survivability, lethality and preparedness of troops has been approved. This includes funding for new weapons, body armour, improved communications and logistics arrangements, at a total cost of $55.6 million. These include:

- the upgrade of night fighting equipment to enable more effective night operations at a cost of $10.2 million;
- enhancement of training areas in Australia to assist in better mission rehearsal training before deploying. This will cost $1.3 million;
- a range of enhancements to body armour have been implemented as a result of operational feedback. In early 2011, the Mentoring Task Force and Special Operations Task Groups were equipped with the new Soldier Combat Ensemble (SCE). The system includes enhanced personal load carriage pouches and the Tiered Body Armour System. This enables commanders to adjust the level of protection of the soldier dependent on their mission profile, by issuing a different body armour vest and ballistic plates. Special Operations troops have their own unique design to suit their mission profiles. Approximately 2,000 vests with different types of load carriage ensembles have been issued at a cost of $30.2 million;
- an enhanced weapons system, in response to operational feedback, to improve soldier performance across a range of operational tasks;
- Remote Viewing Terminals (eg ROVER) are being introduced to provide tactical commanders with greater situational awareness through the dissemination of Imagery to ground forces. This includes the current ROVER IV terminals and the new ROVER V terminals, which will provide operators with the ability to cue precision munitions with greater targeting precision. The application of ROVER will improve response times and collaboration between air and ground forces as well as reduce the risk of fratricide;
- a communications capability will assist information and data exchange in theatre at a cost of $5.7 million. This includes provision of Harris *Falcon* III RF-152-C handheld radios along with RF-300M *Trimline* Vehicular Adapters for installation into a variety of Army vehicles, including Army *Bushmaster* protected mobility vehicles. This equipment provides interoperable tactical voice and data communications for both ground-to-ground and ground-to-air applications;
- a force integration team to incorporate equipment and tactics changes in theatre.

The government will also implement measures to ensure that in the future any new equipment identified as necessary for our troops to complete their mission safely is acquired and reaches them without unnecessary delay.

Enhanced Force Protection funding
Of the $1.6 billion committed for force protection initiatives over the period 2009-10 to 2012-13, (most funded from existing capital investment programs), it was

estimated that some $487 million would be spent in 2010-11, of which $226 million was additional funding.

However, revised estimates for 2010-11 show that $126.4 million has been reprogrammed to 2011-12 and $6.9 million is no longer required due to completion of the acquisition in 2009-10.Thus spending on Enhanced Force Protection measures in Afghanistan is estimated to cost $353.8 million in 2010-11; $482.4 million in 2011-12; and $190.6 million in 2012-13 for a new total commitment of $1,026.8 billion.

LAND 121/4: Protected Military Vehicle—Light

Tom Muir

LAND 121 Phase 4 aims to provide the ADF with some 1300 Protected Mobility Vehicles–Light (PMV–L) and their trailers for command (250); liaison (400); utility (600); and reconnaissance (50) roles. With first pass approval granted in October 2008, this project is expected to cost close to $2 billion.

The PMV-L is expected to provide an optimum balance of survivability, mobility, payload, C4I readiness, usability and sustainability. In each of these areas the levels of performance sought are at the cusp of current technological capacity within an affordable platform.

In the diffuse and highly lethal combat environment of 2020, when the new vehicles are likely to be introduced, the ADF will be required to undertake a wide range of tasks, simultaneously, and at short notice in sometimes complex and urbanised terrain. In particular, low- to mid-level technology adversaries will seek to use complex urban terrain to reduce the effectiveness of long range sensors and communications and sophisticated weapon systems. This reduction in sensor effectiveness may require land forces to operate against adversaries capable of remaining below the detection threshold until committed to engagement.

According to Defence, this scenario is consistent with the ADF experience during recent and current operations. One of the crucial lessons learned is that unprotected military vehicles are extremely vulnerable to small arms, mines and improvised explosive devices (IEDs) that can be easily concealed and detonated at close range. As a result, targeting vehicles is an effective method of inflicting casualties and disrupting operations. This tactic is limiting the use of unprotected vehicles to within secure garrisons and thereby greatly diminishing their utility.

To acquire the Phase 4 capability, Defence is pursuing three separate acquisition options. The decision as to which option should be pursued to production will be made as information on the relative cost, schedule and technical risks becomes available. The three options are:

- Joint Light Tactical Vehicle Program (JLTV) Option
- Manufactured and Supported in Australia (MSA) Option
- Market Available Option.

JLTV option
In January 2009Australia entered into a Land Force Capability Modernization Project Arrangement for the Technology Development (TD) phase of the US JLTV program, aimed at enabling tactical vehicle interoperability and integration between future US and Australian land forces.

The JLTV program is a joint US Army/Marine Corps effort to replace its Humvees, which were never designed to withstand IED or mine blasts, with better-protected vehicles in the 6,200–8,000 kg range. The current production target is for some 50,000 vehicles and trailers, 10,000 less than originally planned due to rising unit costs.

The Technology Development phase, now virtually complete, was designed to demonstrate the integration of mature technologies into a complete system. It will provide assessments of the technical and performance risks to the next phase of the JLTV Program, Engineering and Manufacturing Development.

There were three categories of vehicles in the TD phase. Category A JLTVs, intended for general purpose mobility and to carry a 1,550 kg payload. Category Bs, intended to serve as infantry carriers, command and control and reconnaissance vehicles, and weapons carriers, accommodating a 1,800 to 2,000 kg payload. Category Cs were intended to serve as shelter carriers, prime movers, and ambulances and carry a 2,270 kg payload. In late October 2009, technology development contracts were awarded to three teams:

- AM General and General Dynamics Land Systems (GTV)
- Lockheed Martin and BAE Systems (Lockheed Martin Owego)
- BAE Systems and Navistar Defense (BAE Systems—Ground Systems).

The Lockheed Martin team was granted $35.9 million, the GTV partnership received $45 million and the BAE Systems team $40.5 million for their participation in the 27-month technology development project, which included a 15-month phase to design and build prototypes.

The contracted teams were to each design and build prototype vehicles in the three categories. Of these, the US Government would pay for twenty-one prototypes, while Australia would pay for three additional prototypes from each contender, equipped for right hand operation (RHO), bringing the total to thirty prototypes, ten from each of the competing industry teams. The price for Australia's participation was $40 million.

For the Australian JLTV sub-configuration, the three teams were to each design RHO vehicles in payload categories A, B and C, and fabricate prototype RHO vehicles in B & C categories, together with one Australian-specific prototype companion trailer, for reliability and performance testing. The vehicles destined for Australia were designed to be highly compatible with the US variants, ensuring interoperability between forces, yet tailored specifically to meet the needs of Australian troops.

The RHO vehicle prototypes from BAE Systems and GTV were delivered from mid-2010 to the Defence Materiel Organisation for a five-month long test and evaluation program for reliability and maintainability (RAM) and ballistic testing at

Monegeetta, Victoria. The tests culminated in early 2011with a user trial that focused on requirements validation. Lockheed Martin's RHO vehicles were RAM tested in the US and arrived in Australia later for user evaluations of their reliability and durability at Monegeetta.

Through extensive trialling of the prototypes, the US Army, Marine Corps and the Australian Defence Force have gained accurate assessments of the technical and performance capabilities and risks associated with the technology.

While competitive prototyping during the TD Phase improved the fidelity of the designs, demonstrated mature technology, and increased confidence in operational performance and costs, it is interesting to note that none of the prototypes delivered met all of the needs of the US Army and the Marine Corps. According to the US Army's product manager for JLTV, every prototype design was between a 130 and 440 kg too heavy.

EMD phase

The next major milestone, the Engineering and Manufacturing Development (EMD) Phase, will focus on program risk, supportability, producibility, and affordability. It will also demonstrate system integration, interoperability, transportability, fuel efficiency, reliability and utility.

It is anticipated that a request for proposals will be issued in the last quarter of 2011, with two EMD contracts awarded in early to mid-2012. The EMD phase will last forty-eight months before a low-rate initial production contract is awarded in the second quarter of 2016. Information from the TD has changed the scope of requirements for the EMD phase and a TD solution is not being carried into EMD. The program learned through the TD—which was its *raison d'etre*— that initial categories and sub-configurations were not properly aligned requiring design effort in EMD.

Other examples were:

- the weight of passenger protection impacted on the ability of helicopters to lift the vehicle
- four passenger designs could meet combat, logistics and C2 functions, but not medical evacuation
- delivered vehicles were 10% above predicted weights
- there was limited space to accommodate mission essential equipment and payload.

A major change between the TD and the EMD phases is the elimination of the Category B variant, which proved to be too heavy to meet the required transportability weight. Now there will be two variants—a Combat Tactical Vehicle (CTV) that can transport four passengers and carry 1,560 kg and a Combat Support Vehicle (CSV) that can transport two passengers and carry 2,270 kg.

In addition to prototypes of production models, the EMD phase will require detailed CAD models of JLTV EMD designs that will enable US Government engineers to

evaluate sub-system and component design approaches, verify dimensions, material selection, and make estimates on weight.

While the business case seeking government approval for Australia's participation in the EMD phase is still in development, it is more than likely that interest in the JLTV program will continue, despite program delays. To this end, potential contenders for the EMD phase have been advised of ADF requirements for 1,300 RHO vehicles in both categories, subject to Australian Government agreement to proceed. These comprise 850 General Purpose, 50 Command and Control on the Move, 400 Utility and 1,288 AU Trailers. Australian specific requirements for JLTVs configured to RHO mainly relate to Australian Design Rules (ADR) compliance.

It is anticipated that the EMD request for proposals will likely seek RHO variants in both categories, with Australia presumably liable for any additional design or other costs as part of its price for participation, should that eventuate. US industry has also been advised that Australia wishes to negotiate and execute Australian Industry Capability (AIC) and Global Supply Chain (GSC) deeds with successful the selected EMD participants.

MSA option

In announcing Australia's intention to participate in the JLTV program in late 2008, then Defence Minister Joel Fitzgibbon emphasised that: 'Through the JLTV Program, Australia and the US will be devoting considerable resources to developing a light mobility vehicle with the best possible protection for our troops on operations'.

Stung at this dismissal of local industry capability, (and like others, smarting from the impact of the global financial crisis) Thales Australia thereupon lobbied strongly for a PMV-L capability that was both manufactured and supported in Australia. This was on the basis that the company was building the successful *Bushmaster* protected mobility vehicle, in service with three nations in Iraq and Afghanistan, whose design the company would leverage to develop a PMV-L prototype for local manufacture and support, with possibly subsequent export opportunities.

The government acceded to these overtures and in June 2009 Defence—which had hitherto regarded the JLTV option as the obvious choice due to scale economies from a 50,000 production run—released a request for proposal (RFP) for a locally manufactured and supported PMV-L. Respondents would need to provide a statement confirming that the proposed PMV-L capability would be manufactured and supported in Australia.

This meant that a minimum of 50% of the production or manufacturing costs would be incurred in Australia, and that the logistics infrastructure necessary to support the proposed PMV-L capability throughout its life of type could be provided from within Australia. Following assessment of the responses, in May 2010 it was announced that there would be three new competitors for the Phase 4 PMV-L requirement. They were:

- Thales Australia, offering its all-new *Hawkei* 4x4 which draws on the technology and expertise it developed on the *Bushmaster* program;

- General Dynamics Land Systems (Australia), offering an enhancement of the proven *Eagle IV* 4x4, which is already serving in Afghanistan
- Force Protection Europe, offering its innovative *Ocelot* 4x4, which was chosen last month by the British Army to satisfy its very similar Light Protected Patrol Vehicle (LPPV) requirement.

Two months later, MSA Development contracts were signed with each of the contenders. Under their contracts the MSA contenders would each deliver two prototypes by late-February 2011. These would be tested at Monegeetta to demonstrate they could do what their manufacturers had promised and also, crucially, that they were production-ready, demonstrating a Technology Readiness Level (TRL) of six—the same as that of the JLTVs.

Sure enough, by 23 February 2011 all three contenders delivered two prototypes each to Defence for evaluation tests as part of the next stage of the land program, which includes destruction of the vehicles in final blast tests.

To make an informed choice between the MSA and JLTV options, Defence had aligned its decision-making milestones with those of the Pentagon, with the Intermediate Pass approval planned to decide in mid-2011 which of the three MSA contenders would go forward to a competitive tender.

But if Defence was expecting that its evaluation of tenders for the MSA option would lead to a preferred solution about the time that a winning tender from JLTV would emerge, it was wrong. The EMD milestones, from contract award to completion, have been extended to forty-eight months which means that a JLTV candidate may not be available for comparison until around 2016.

It is yet to be determined how the Australian selection process will compare the MSA and JLTV contenders. The new PMV(L) was due to enter service around 2016–18 but, due to the extended milestones of the EMD phase, we may now see an initial operating capability (IOC) deferred until around 2019–20.

Market available option

According to the Defence Capability Plan, Defence will develop solicitation documentation for a 'current generation market available' Protected Mobility Vehicle–Light. This will be done in parallel to the development of the JLTV and MSA Options.

Should proposals from industry be sought under this 'market available' option, the specifications for the PMV-L would be identical to those sought under the MSA option with the exception of the stipulation that the vehicles be manufactured in Australia. They would nevertheless need to be supported locally in terms of maintenance facilities, technical support, technology transfer and so on.

The market available, military-off-the-shelf approach, can be seen essentially as a hedge against either or both of the other two options failing to produce the PMV-L capability sought. It is understood that the market for vehicles of this type is being continuously monitored and if this option is eventually pursued, the net may well be cast wider than those currently under consideration for the MSA option.

While there will be some cost advantages with this market available option compared to local manufacture, neither can match the sheer advantages of scale that come with the JLTV's substantial production run for the US military. Hence Defence's understandable willingness to accept the delays that are emerging as the JLTV program moves into its next phase.

SEA 1000: the future submarine

Gregor Ferguson

While the debate continues over what type of Future Submarine the Navy should acquire, and the roles and tasks it should be expected to carry out, there's one thing that's not in doubt. At some point Defence must choose how and by whom the new submarine will be designed and built, and how the massive technical, cost and schedule risks embedded in this project will be managed and mitigated.

Project SEA 1000 – Future Submarine will be shaped by two decisions that need to be made as early as possible. First, what is the submarine required to do, and therefore what type and size of submarine is actually needed to do this? And secondly, what sort of Combat Management System (CMS) and weapons should the submarine be equipped with? The answer to the first question to some degree shapes the answer to the second; together they shape the entire outcome of the project.

The December 2010 edition of the Defence Capability Plan (DCP) sets out four phases for SEA 1000. Phase 1 is Design, with 1st Pass Approval due some time between 2011 and 2015. But the June 2009 DCP split Phase 1 into three sub-phases, the first of which was supposed to achieve 1st Pass Approval by mid-2011. While it might be harsh to suggest that Phase 1 has incurred a four-year delay with the passage of just 18 months, it's clear Defence has not settled on an approach, still less a timetable, for the design process.

And with 2nd Pass Approval for Phase 1 due between 2014 and 2019, the DCP doesn't even contain indicative schedules for Phases 2 to 4—Acquisition, Weapons and Maritime-Based Strategic Strike. Therefore it's impossible even to guess at the likely schedule and cost of this project at present. Indeed, without a clear answer to that first critical question, one might wonder why SEA 1000 has even been included in the DCP. Or, conversely, given it is in the DCP, why hasn't faster progress been made?

Taking the former question first, by the end of this year Defence's Future Submarine Project Office is due to present a list of options to the Federal Cabinet: essentially, these will be interpretations of the requirements stated in the 2009 Defence White Paper (DWP), along with options for achieving them, at increasing levels of cost and complexity.

Concurrently, the Operational Concept Document (OCD) for the Future Submarine is being developed as part of a portfolio of essential documents: Top Level Requirement, the OCD itself, Functional Performance Specification and Test Concept Document. The Project Office putting these reports and documents together is an integrated team of DMO, CDG, Navy and DSTO staff, responsible in project terms to

the Head of CDG but physically located in, and supported by, the DMO.

The discussion over the submarine's role, and therefore the type required, is not part of this project brief. Instead, it examines the mechanics of scoping, designing and eventually building a new submarine within the context of the four options that Defence believes it faces:

1. **Military Off-The-Shelf (MOTS):** essentially the purchase of an existing submarine design (including potentially the *Collins* itself) with minimal design changes from a notional 'baseline'—noting, of course, that even when buying a MOTS design such as the German Type 214 different customers select different CMSs, weapons, sensors and the like. There is inevitably some integration risk, but major design or configuration changes are unlikely so the risk is relatively contained.
2. **Modified MOTS:** essentially a significant evolution of the *Collins*, still equipped with the AN/BYG-1 CMS and associated Mk48Mod7 CBASS torpedo. For reasons discussed below, Options 2 to 4 are based on the assumption that Defence will mandate these items.
3. **Evolved Design:** a significant evolution of an existing, modern, non-*Collins* design modified significantly to carry the larger BYG-1 and a larger crew
4. **Bespoke Design:** an all-new submarine design.

About the only things that are a given in the Future Submarine are the use of the Mk48 Mod7 CBASS torpedo and an Air-Independent Propulsion (AIP) system to increase submerged endurance in the boat's patrol area. However, there are a number of choices of AIP system, each with their own champion submarine designer.

The second major question is the choice of CMS. This needs to be addressed at the same time as the choice of submarine type, and the two questions are closely related. Navy's experience with the original Rockwell CMS on the *Collins* led to a strategic decision to replace it with so far as possible the same CMS as the US Navy's submarines (which of course are all bigger and nuclear-powered). Even slimmed down by Raytheon to fit into the *Collins*, the resulting AN/BYG-1 is quite large and has significant power and cooling demands.

However, this decision conferred a unique status on the RAN. Its Armaments Cooperation Program with the US Navy makes it the only other navy in the world to use the BYG-1 and Mk48 Mod7 CBASS torpedo. Australia plays a direct, though very junior, role in developing both of these items; indeed, the torpedo and the access the RAN enjoys to US Navy strategic communications capabilities are probably the true 'crown jewels' of Australia's submarine capability. It's likely that Project SEA 1000 will seek to preserve these advantages in at least one of the suite of options provided to government.

The interoperability these afford with the US Navy is highly prized, as is the resulting very high fidelity the two services can achieve in training: the RAN is the *only* navy in the world that routinely fires torpedoes (inert, rather than war shot) at US Navy submarines on exercises. This is only allowed because the US Navy trusts the weapons, the CMS and the operators. Australia benefits from highly realistic training

against nuclear boats, while the US Navy benefits in return from exposure to Australia's diesel-electric boats.

The RAN can also depend upon US parent navy support for the CMS and torpedo and, for a fraction of the total investment required, it benefits from the totality of the enhancements developed for these items. Furthermore, a decision to stick with the BYG-1/Mk48 torpedo combination eliminates a massive amount of development and integration risk, not to mention the cost of acquiring an all-new inventory of underwater weapons, and upgrading these and the CMS regularly.

Australia has made a significant investment in its extremely close relationship with the US Navy and it would require a strategic decision at Cabinet level to, in effect, downgrade it. This can't be discounted, but notwithstanding dissatisfaction in both navies with aspects of the BYG-1's performance, it appears unlikely the Navy would advocate such a course of action.

Selecting a MOTS design rules out the current BYG-1 as an option. None of the likely contender—Germany's Type 214, Sweden's A26, Spain's S80 and the French *Scorpene*—are big enough to accommodate the system comfortably (indeed, if Navy insists on in-service designs that means the only realistic options at present are the Type 214 and *Scorpene*). That said, Spain's S80 uses a US-sourced (from Lockheed Martin) CMS and sonar suite. While the S80 hasn't been to sea as yet, the principle that a US combat system and sensor suite can be built for a MOTS submarine is validated; integrating this with the Mk48 CBASS and a secure gateway to the US Navy's communications environment is a relatively small step further.

Conversely, a decision to stick with the BYG-1 (as currently configured) and Mk48 CBASS capability effectively rules out a MOTS design: the RAN by default will probably be forced to contemplate Options 2 to 4. Furthermore, the US Navy has a power of veto on the nature of the equipment and sensors with which the CMS and torpedo must be integrated and on the nature of the interface between them. This will shape Australia's decision-making processes quite significantly.

Option 2, an evolution of the *Collins*, looks attractive at first glance but the *Collins* design is already 25 years old. Its shape was defined by a combination of external sensor size, shape and location imperatives. Modern sonars are different—as the British *Astute*-class design shows, new-generation sonars such as the Thales 2076 make possible more efficient hull forms. The *Collins*-class design doesn't lend itself easily to such major changes, quite apart from the challenges inherent in adapting the basic platform for replacements for her troublesome diesels and generators, new battery technologies and Air-Independent Propulsion (AIP). A new, modern design based on the *Collins* philosophy would be tantamount to selecting Option 4.

In practical terms, Options 3 and 4 amount to much the same thing: by some estimates, significantly changing and enlarging an existing design to accommodate both the BYG-1 and the large crew the Navy believes may be necessary for extended patrols would require as much as 75% of the design effort of building an all-new design. In fact it may be closer to 100%, with the added risk that trying to create a new package within an existing configuration may result in uncomfortable design compromises that a clean-sheet design could avoid.

Furthermore, no submarine manufacturer ever starts from a clean sheet: every new design is shaped by the builder's existing practice and technical knowledge. This accounts for the fundamental differences between submarine 'families' designed by different shipyards. A significantly modified MOTS design in the 3-4,000 tonne class might closely resemble a bespoke design from the same company with a similar technology heritage, but the bespoke design may be a more elegant and efficient technical solution.

However, specifying a heavily modified MOTS design rather than a bespoke one might impose a useful discipline on the project in terms of limiting the operator's ambition: a 'clean sheet' design, even if it is a direct descendant of an existing submarine family, may provide unwelcome scope for unrealistic demands and expectations and unwarranted technical and commercial complexity.

Choices, choices

If the government decides a MOTS solution (without the BYG-1 CMS) is the right answer for Australia, selecting the right submarine still isn't necessarily easy. Australia will need ongoing access to design and manufacturing expertise and IP in order to build, test and operate the boat, and eventually to upgrade it. Not only must it negotiate the right access to this IP and expertise with the company concerned (and its many suppliers), it must negotiate an over-arching agreement with the company's government to enable the transfer of this expertise and data. History suggests it won't be an easy task.

If the government directs Defence to look at Option 3 and/or 4, additional challenges emerge. The greater the departure from a MOTS platform, the greater the uncertainties. Significantly enlarging a MOTS design means significantly altering key elements of the platform and machinery configuration. Assuming it feels bound by its OCD (as opposed to being open to trading off performance for lower project risk), Defence will need to undertake, or pay for, R&D to determine the most appropriate configuration for the platform and sensors. This will need to address the propulsion system including electrical and diesel motors, batteries and generators and the AIP system. It will also need to address the architecture and configuration of the sensors and communications systems and their interfaces with the CMS.

And if the government *doesn't* mandate a version of the BYG-1, the R&D will also need to examine CMS options in detail before making a choice.

The R&D will be vital to raise both the level and the currency of knowledge within Defence, DSTO and Industry in these areas, and to help identify the features they need, or want, in the submarine. It's likely that test beds will need to be constructed to assess potential propulsion, energy storage and generation equipment and configurations, and their strengths and weaknesses. This R&D capability will also be necessary to address engineering challenges posed by unique (for conventional submarines) Australian operating requirements such as conducting long ocean transits at a reasonable speed without sacrificing stealth.

This constitutes a 'pre-competitive' stage in the acquisition process. In parallel, Defence needs to be exploring the art of the possible with the European submarine

designers and their parent governments. While significant expertise is available from the USA, American submarine designers lack the intimate knowledge Australia requires of non-nuclear propulsion, energy management and AIP technologies and their integration into a compact platform; the US Navy is an all-nuclear submarine force, which is partly why the BYG-1 is so big, heavy, hot and power-hungry.

Defence must identify submarine builders with the right design capability, ownership of the necessary IP which they can then apply unfettered to Australia's needs, and a network of suppliers and sub-contractors. This last factor is vital: a submarine is the product of a national effort. When you buy a submarine design you're buying the entire national supply chain. No nation supports more than one submarine design family and technology base, so aspirations to 'cherry pick' battery technology from one source, a platform design from another and AIP from a third, for example, and then trying to integrate them are simply unrealistic and unworkable, both technically and in dealing with the Intellectual Property (IP) management and protection challenges involved. That said, within a single national framework there is flexibility in specifying and selecting equipment and components.

Once candidate submarine yards and governments have been canvassed Defence should have sufficient information on which to build a competitive selection process so that rival candidates (if there is more than one) can be compared. It's not clear at this stage how far candidate submarine designers will need to develop their proposals in order to provide a realistic basis for a technical comparison.

Australia's own submarine builder, ASC, hasn't featured thus far in this discussion because, arguably, it lacks the sheer weight of resources to design a bespoke submarine from scratch and the IP access required to evolve an existing design (except, possibly, the *Collins*). Furthermore, it lacks direct experience of integrating AIP and also of some emerging battery technologies such as Lithium-Ion (Li-Ion) cells, and the safety regimes surrounding them. The adjacent Pacific Marine Batteries, however, has been undertaking Defence-funded studies into future energy storage requirements and solutions.

Nevertheless, ASC's Deep Blue Tech (DBT) subsidiary is the only organisation in Australia currently undertaking anything like detailed platform design studies and has set itself the mission of becoming the designer for the 'entire lifecycle of Australia's future submarines'. Funded entirely thus far by ASC's internal allocations, DBT's two dozen design engineers have been studying combat system, platform and propulsion options as well as developing things like project requirements definition and design processes, identifying signature challenges and creating models for developing system architectures.

DSTO is also conducting a range of technology and human factors studies in different areas and has recently completed a combat system comparative study. Some of this work is self-initiated, with an eye to the ADF's future needs for Science & Technology (S&T) advice and some of it has been funded by the SEA 1000 project.

However, much of the specialist knowledge required to design a new submarine and the expertise to integrate it efficiently into a coherent whole will need to be sourced from, or through, a design partner with the blessing and active support of its

government. The art of the possible in this context is determined to a significant extent by the closeness of the government-to-government relationship, by the commercial relationship between the Commonwealth, ASC and the partner concerned and by issues such as technology and IP transfer to Australian industry. Besides, if a design partner is selected competitively then ASC must be a neutral actor until a final choice is made—if, that is, the Commonwealth intends to use ASC as the submarine builder in any case. It may choose to engineer some other commercial arrangement (possibly involving ASC, or not, as the government determines), which would complicate the industrial picture still further.

In line with the Kinnaird recommendations, a significant amount of money—Kinnaird recommends as much as 10-15%, possibly amounting to over $3 billion—should be spent up-front to address these issues and to de-risk the project so far as possible. Some of this must be spent on the pre-competitive R&D, but will it then be possible to fund a competitive (and meaningful) Initial Design Activity (IDA) phase? And on what basis will a design partner subsequently be selected? How much genuine choice will Defence have, and would Australia be better off choosing a strategic partner early on and then investing the necessary resources in building the right technical and commercial relationships?

A significant proportion (possibly a majority) of the R&D will need to be undertaken after contract signature, when the detailed design of the submarine is being developed. If this is done in partnership with ASC, notwithstanding the need to stick to the design partner's network of suppliers, the potential exists here to apply some competitive leverage both in the choice of major configuration items and the selection of Australian industry suppliers and sub-contractors. The DMO could opt to mandate some sort of competitive process in Australia to select local suppliers and partners, or could leave it to ASC and/or the platform designer?

Further complicating matters, if government mandates the BYG-1 and Mk48 CBASS, the US Navy will have a direct say in how the design and platform integration processes are carried out. There may be a powerful preference for an Australian prime contractor acting as both a conduit and firewall (as circumstances dictate) between the platform, sensor suite and CMS suppliers. The technical, security and commercial arrangements for creating such an environment may end up very complicated, specially if a European platform designer expresses concern about exposure of their IP to the US Navy, and vice versa.

Challenges

The Future Submarine project faces further significant challenges. The first is *time*—if a new submarine is required to be in the water in time to replace HMAS *Collins* by 2025, then time is running out, especially if the government approves a bespoke design. As noted earlier, first Pass Approval for Phase 1 has slipped to some time between 2011 and 2015 and the schedule and budget for the acquisition phase hasn't even been decided yet.

If the retirement of HMAS *Collins* in around 2025 represents any sort of firm deadline, every year which passes increases the pressure on the project, and reduces the number of options open to Australia. A time may come when Australia has no choice but to adopt a MOTS solution, possibly even a small batch of 'interim'

submarines to maintain an operational and training capability pending arrival of an all-new design, because no other solution will be available in time.

The second challenge is *maintaining expertise*—during the early-1980s, when the *Collins* project got under way, the RAN had six *Oberon*-class submarines in service with an experienced cadre of submariners (including platform and electronics engineers). It also had several hundred engineers and naval architects in the Naval Design Branch. The rump of this professional capability, amounting to less than fifty people by some estimates, now resides in the DMO; meanwhile the well-publicised difficulties with the *Collins*-class boats have resulted in a hollowing out of the Navy's professional submariner ranks.

Put bluntly, the Navy and DMO are much less able to act as smart customers than they were thirty years ago. This should be the cause of great worry within Defence, for two reasons. Firstly, industry arguably currently lacks the large pool of design expertise to offset Defence's own shortcomings. Secondly, and more worryingly, the US Navy's concerns over the nature of the interface between the Mk48 Mod7 CBASS torpedo, BYG-1 and the platform and sensors with which they will be integrated might require an Australian prime contractor or possibly an alliance arrangement similar to that of the Air Warfare Destroyer Project. This need to manage the firewall between US Navy IP and a European platform and propulsion specialist will absorb a significant proportion of the available management, commercial and technical talent.

The third hurdle is *process*—the DMO's processes and outlook are increasingly geared to the needs of MOTS purchases. Regardless of the recent dramatic up-skilling of its project managers the DMO and CDG still lack decision-making experience and, arguably, people with the technical and specialist domain knowledge of submarine operations and construction necessary to run a complex, high-risk developmental project.

Furthermore, risk-aversion will inevitably slow the process. Risk tolerance is a function of professional and technical expertise, neither of which are in abundant supply in Australia's broader submarine community. Processes will not compensate for a lack of direct experience and the instincts and judgement that are built through it.

The DMO and CDG will be dependent on their European and US technical and industrial partners, and on DSTO and ASC for indigenous expertise—hence the importance of whatever R&D can be done in this country at the pre-competitive stage to build local skills and expertise.

The fourth challenge is *Intellectual Property*—the IP in a submarine design is of strategic importance to both the operator and the designer. The DMO, and indeed the Commonwealth government more broadly, needs to understand how perceived threats to the integrity of this IP will affect and drive the behaviour of the companies and organisations that are its source. Defence has shown little real understanding in the past of how industry works and of the things that motivate it and drive its behaviour.

If it hasn't learned these lessons already from the *Collins*-class submarine project, trying to learn them 'on the job' during the Future Submarine project won't improve

the chances of success, especially if any unforeseen problems with the *Collins* fleet further intensify schedule pressures.

SEA 1439: improving & sustaining the *Collins* class subs

Tom Muir

Against a horror backdrop of submarine unavailability, with only one submarine (HMAS *Waller*) actually available for operational service following a generator failure aboard HMAS *Farncomb* in January 2010, the Defence Materiel Organisation (DMO) has reorganised the way the submarines are supported.

A maintenance review was conducted in early 2010 against the nuclear US *Los Angeles* 688 class and the Swedish conventional *Gotland* class. While a study of maintenance costs of the *Los Angeles* and *Gotland* classes could not provide a robust benchmark due to the significant differences in virtually all respects with the *Collins* class, it did indicate that the *Collins* was likely to have a high cost to sustain given its unique characteristics. This led to a detailed review of the *Collins* sustainment system to establish an internal benchmark.

Submarine sustainment is now managed from Adelaide, where DMO and Navy staff work in an Integrated Product Team with ASC Pty Ltd, the submarines' builder and maintainer. An Integrated Master Schedule, whose objective is to ensure that three submarines are available at all time, has been agreed and work is underway to establish a new performance-based maintenance contract to commence in the coming financial year (FY2011-2012.) The DMO envisages that higher levels of funding will now be required for these reform initiatives.

The Navy's current requirement is four submarines manned and operating from Fleet Base West. Three of these will be available for sea at any one time, with one in some form of maintenance availability. By the end of 2010, three submarines were available for operational tasking out of Fleet Base West.

The various phases of SEA 1439 described below give some indication of the level of work involved in ensuring that a capability advantage over regional submarines is maintained by the *Collins* class. They are also indicative of the problems ASC has had to face in coping with a workload that may not have been anticipated with the original Through Life Support (TLS) contract.

SEA 1439

While the high priority task of replacing the tactical component of their combat systems, with the US-sourced AN/BYG-1 tactical C2 system continues, other enhancements and updates have been performed and more are planned, as part of the ongoing program of maintaining and improving the *Collins* class submarines.

SEA 1439 is a multi-phase program of work. Phases 3, 4 and 5B.1 are current and ongoing. The unapproved Phases 3.1, 5B.2 and 6 are concerned with the requirements to update *Collins* class ship control, communications, electronic warfare and sonar systems. For convenience sake the phases are briefly reviewed in numerical order.

Phase 3—sustainability and reliability enhancements
This ongoing phase consists of a large number of discrete modifications to the *Collins* submarines and shore infrastructure. They have been introduced progressively over a number of years and are fitted to submarines during docking cycles. Major activities remaining include modifications to fire fighting safety, sewage system automation, the submerged signal ejector, diesel safety modifications and the capability to embark Special Forces.

Also under this phase torpedo countermeasures trials were aimed at introducing the countermeasures system into operational service by the end of 2010 and the shore-based propulsion control and reference system was due to be completed by mid-2010.

Approved expenditure on this phase is $412 million, of which $299m was spent by 30 June 2010 and a further spend of $17m to 30 June 2011 is anticipated.

Phase 3.1—*Collins* obsolescence management
Phase 3.1 will replace or remediate the integrated submarine control monitoring and management system (ISCMMS), which employs nineteen computers with Motorola processors sited around the submarine to monitor more than 5000 data points. It is based on the SCC-200 steering control system developed by Saab Instruments for Swedish submarines and escaped attempts to reconfigure it other than as an adaptation to the demands of the larger Australian design.

In an RFP issued in July 2009, Defence sought costed options for the partial and/or complete replacement of the currently obsolete ISCMMS, to be available for platform integration within –twelve to eighteen months of government approval. An obvious contender for the replacement is the original equipment manufacturer, Saab Instruments AB. The RFP process will be followed by a restricted Request for Tender (RFT) process in 2011 to finalise a system provider prior to second pass approval in 2011–12 to 2013–14. The DCP anticipates an acquisition cost of up to $100m.

Phase 4A—replacement combat system
This phase has involved the replacement of the tactical component of the combat system by the US Navy's AN/BYG-1 tactical command and control system, sonar control and display upgrades, plus system and navigation improvements. Installation of the RCS is now complete on *Waller*, *Farncomb* and *Dechaineux,* with the two former achieving operational release in 2010. Installation is progressing with *Sheean* and is due for completion by late 2011. The final two systems will be installed on *Collins* and *Rankin* during their respective dockings in 2011 and 2012.

Although the new heavyweight torpedo (CBASS) is being procured and installed into the submarines under a separate project, it has involved platform and software modifications across the *Collins* class. The new torpedoes have been installed in *Waller* and *Farncomb* and have achieved operational release. Platform modifications have been completed in *Dechaineux* and are progressing in *Sheean*. Modifications to *Collins* and *Rankin* will occur at future dockings.

Approved project expenditure for Phase 4A is $450 million, of which $422m was spent by 30 June 2010 and a further $5m is the estimated spend for 2011.

Phase 5B.1—communications mast and antenna replacement
Phase 5B.1 has provided for a class wide fit of the OE-538 communications antenna and its associated Quiet Modular Mast acquired through MacTaggart Scott and US firm Sippican (a subsidiary of Lockheed Martin). The OE-538 is reported as covering typical military communications bands, including VLF, HF, VHF, UHF satcom (satellite communications) and line-of-sight (LOS) communications.

Currently, all US Navy submarines operating at periscope depth, including the new *Virginia*-class attack submarines, use the OE-538 antenna system as their primary method of communicating with aircraft, surface ships and land-based assets. A further development of the mast system will provide improved performance in the UHF signal band. It also will add Link-16, *Iridium* and Mobile User Objective System (MUOS) UHF satellite communications capabilities, while maintaining performance in legacy bands. Presumably the *Collins'* OE-538 systems will match these developments as the MUOS capability is of special interest to Australia with a MUOS ground station established near Geraldton WA.

The upgrade also provides access to the *Iridium* network, which covers the whole earth. The ADF currently uses the Iridium fleet for paging, voice and data communications and its utilisation of this low-cost satellite capability is to be extended.

Phase 5B.2—*Collins* communications and electronic warfare improvement
Over the years the *Collins* internal and external communications systems have been upgraded intermittently, but a major boost has been the class fit of multi-functional antennas, under Phase 5B.1. Now Phase 5B.2 aims to deliver a modernised submarine communications system, elements of which will include acquisition of a high data rate (HDR) satellite communications capability, a replacement communications centre (ComCen), enhanced shore-based communications centre and provision of a submarine-wide multi-enclave Local Area Network (LAN) for which the RPDE organisation has assisted in overcoming the complex technical problems of implementing a submarine LAN backbone.

The ComCen is the hub of each submarine's External Communications System (ECS) and provides command and control personnel with 'through-air' external voice and data communication facilities in the VLF to UHF frequency bands in a high-grade security environment. The communications capabilities currently provided by the CommCen include reception of fleet broadcast; ship-to-ship, ship-to-shore and ship-to-air transceive; and satellite communication.

With these improvements, the *Collins* submarines will have access to fast developing satcom capabilities with bandwidth and data rates previously inaccessible. One driver for higher data rates and more comprehensive communications capabilities has surely been the new AN/BYG-1 replacement combat system, with its attendant demand for higher tactical throughput and assured interoperability as well as the demands of a less benign strategic outlook.

But beyond this, if the *Collins* submarines are to operate effectively as nodes in joint and coalition net centric operations they must have the capacity for wideband

communications across the air, land and maritime domains, allowing the submarines to share a common operating picture with ADF and allied forces.

Part of the communications upgrade includes a high data rate (HDR) satellite antenna. In the US the sub-HDR program provides submarines with antennas that have the bandwidth, gain, and flexibility for communications in the super high frequency (SHF) and extremely high frequency (EHF) spectra. Higher data rate communications are seen as necessary for ships to participate fully in network-centric warfare and for *Tomahawk* land attack missile (TLAM) mid-course guidance.

Advantages for Australia include the ability to transmit and receive information over the Wideband Global Satellite (WGS) system as well as access to the USAF's Advanced Extremely High Frequency (AEHF) system, which is joint with Canada, the Netherlands, and the United Kingdom. For this phase of SEA 1439, the HDR Satcom solution sought includes all hardware and software required to be installed on the submarines to transmit and receive information over the WGS system.

As the communications equipment design authority, Boeing was responsible for earlier communication systems upgrade on submarines as part of the Fast Track program and subsequent endeavours have included both internal and external communications systems upgrades.

This phase will also include enhancements to the fitted electronic warfare (EW) capability and to the thermal imaging (TI) capability of the search periscopes. The Collins fleet is equipped with the ITT (EDO) ES-5600 electronic support system sensor. The system operates in the 2GHz to18GHz radar band, extendable to include 0.5-2 and 18-40 GHz. It provides automatic detection, direction finding and identification of radar signals. An EDO Argo Systems AR-740 radar warning receiver is also fitted. The upgrade sought for the ESM under Phase 5B2 is likely concerned with extending the submarines' electronic intelligence (ELINT) gathering capabilities.

There is considerable Australian content in the *Collins* ESM antenna design and this combined ESM and RWR system was developed to provide an improved performance replacement for all of the lower performance, simple design, amplitude monopulse systems currently used on ships and submarines.

First pass approval for Phase 5B.2 has been granted. The acquisition cost is estimated to be between $350-450 million with a YOD of 2011/2012 to 2012/2013.

Phase 6—*Collins* sonar replacement

According to the DCP, this sonar upgrade is required to maintain a capability advantage against regional submarines. The sonar system is the primary submarine sensor suite, and for the purposes of this project, includes all aspects of the mission system from the outboard sonar arrays through to the inboard display consoles and associated processing. It also includes the shore facility, which includes a sonar reference set and training operator consoles that will be used initially for system integration, and subsequently for training and development support.

The submarine fleet is currently equipped with the Thales Underwater Systems *Scylla* active and passive sonar arrays fitted to the bow, fin, casing and flanks of the

submarine. Collins can be fitted with either the *Kariwara* or the *Namara* thin-line towed array.

Phase 6 aims to upgrade the sonar system in the *Collins* class submarines through a program of replacement and improvement of on-board processors and outboard sonar arrays to meet a range of capability requirements. Defence's preference is for a system based on a proven military-off-the-shelf (MOTS) system, using commercial-off-the-shelf (COTS) computer hardware and open architecture (OA) permitting the insertion of products from multiple vendors. It would also provide a path for subsequent incremental improvements and capability insertions through a regular technical refresh program.

The Navy is adopting OA as a way to reduce the rising cost of naval warfare systems and platforms and to increase the capabilities and interoperability of naval systems. OA allows for the rapid incorporation of more COTS technology in warfare systems and enabling reuse of software and related assets. More importantly, OA will contribute to greater competition among system developers, as the use of open standards and standard, published interfaces rather than bespoke protocols will allow smaller firms to compete.

Delay with this project has been due to the consideration by Defence of the wider *Collins* sustainment issues and the negotiation of a new in-service support contract with ASC. The acquisition cost is $500 million to $1 billion, with a year of decision FY 2011–12 to 2013–14.

SEA 1448 Phase 2B: *Anzac* frigate anti-ship missile defence

Gregor Ferguson

Famously dismissed by former Minister for Defence Industry, Science & Personnel Bronwyn Bishop as ‘floating targets’, the RAN’s eight *Anzac* class frigates were products of their time. They were originally designed in the 1980s as 2nd tier combatants to operate in a benign environment. Their air, surface and underwater warfare capabilities were deliberately limited to reduce costs and were barely equal to the task of self-defence in a region in which maritime and air warfare capabilities were growing fast across the board.

The limitations inherent in their design—they were ‘fitted for but not with’ a number of additional capabilities—became apparent during the 1990s, as did the flaws in an ADF force structure based on tiers of operational capability. The ships’ limitations have been addressed in two overlapping upgrade programs. The first, which is now complete, was an extension of the original construction project, SEA 1348, into Phase 3: Underwater/Surface Warfighting Upgrade, or USWUP. This saw the ships armed with Boeing *Harpoon* anti-ship missiles and a Thales Mine and Obstacle Avoidance Sonar (MOAS) which increased the ships’ offensive power but did little to reduce their vulnerability to air and missile attack.

Project SEA 1448, which got under way early last decade, has sought to improve the survivability of the Anzac frigates by introducing a package of sensor, Combat Management System (CMS) and weapons upgrades at a combined cost of

$778 million. These will transform the ship's self-defence capabilities as well as providing it for the first time with the ability to protect the ships around it.

Phase 2 represents something of an anomaly in today's defence business environment: it is a high-risk, developmental project which is fitting the *Anzac* frigates with not one but two new, solid-state Phased Array Radars (PAR) designed and developed entirely in Australia. The radars are the multi function CEAFAR and CEAMOUNT illuminator, developed by Canberra-based CEA Technologies Pty Ltd. Along with the radars (which will be mounted on an all-new lightweight main mast designed and built in Australia by BAE Systems), the *Anzac* ships are receiving a significantly upgraded CMS, the Saab Technologies 9LV Mk3E, which has an increased data processing capability to match the planned sensor and weapons improvements; a new Infra Red Search & Track (IRST) system, the SAGEM VAMPIR; and a new SHARP EYE navigation radar supplied by Kelvin Hughes.

Phase 2A covered the upgraded CMS and new IRST and navigation radar. Phase 2B covers the two PARs and associated platform modifications. The large number of interlocking components to be integrated makes this a highly complex, and therefore very risky, project; the technological challenges compound the risks. Not surprisingly, therefore, the Navy and DMO have monitored the project extremely closely.

Interestingly, early in the project Defence hedged against possible disappointment by planning for the acquisition of a Very Short Range Air Defence System (VSRAD) such as the MBDA *Sadral* IR-guided missile as a last-ditch defence against anti-ship missiles. An indication of the success of the radar technology and the project's risk mitigation processes was the decision in 2007 not to proceed with this; the trials conducted up to that point showed that CEAFAR and CEAMOUNT have the range, resolution and discrimination to detect incoming targets and guide the ship's ESSM missiles with sufficient accuracy to render a VSRAD unnecessary (In 2005 Navy signed away this requirement as part of Government consideration. In 2007 modelling confirmed CAEFAR's forecast probability of kill).

Still, when Project SEA 1448 Ph.2B was named on Defence's list of Projects of Concern (POC) in 2009 by the then the Parliamentary Secretary for Defence Procurement, Greg Combet, this came as something of a surprise. The project has kept to its schedule and budget and observers had detected no significant difficulties or delays despite its complexity and the integration risks it faced. That said, both the upgraded CMS and the new IRST systems encountered teething troubles that were mostly solved through land-based testing during 2009 and were validated when the entire upgrade package went to sea for the first time. This happened in February 2011 when the lead ship of the project, HMAS *Perth*, put to sea from Fleet Base West equipped with the entire suite of new and upgrade equipment and sensors.

Anzac baseline

As constructed, the *Anzac* frigates are fitted with a single Saab CEROS 200 missile director above the bridge and a Mk41 missile launcher capable of containing thirty-two vertically launched *Evolved Sea Sparrow* Missiles (ESSM). The CEROS 200 tracks incoming targets and 'illuminates' them with radar energy; the ESSM seeker head then homes in on the energy reflected off the target. While an effective combination, the CEROS 200 can only track one target at a time—in the jargon, it

provides only a single 'channel of fire'. Obviously this leaves the ship vulnerable to saturation attacks by multiple aircraft and missiles.

The CEAFAR and CEAMOUNT change all this. The multi function CEAFAR, which sits on a cupola atop the new main mast, has six fixed independent antenna faces and detects and tracks incoming targets which it then 'hands off' to the CEAMOUNT illuminator. This sits on the corners of the cupola and performs the same illumination function as the CEROS 200. But the CEAMOUNT is a solid-state radar with four independent antenna faces pointing in different directions rather than a single dish which needs to be trained on the target. As a result, its agile beam can jump quickly between multiple incoming targets to illuminate each one for a different ESSM. The technology that enables this is called Interrupted Continuous Wave Illumination (ICWI). The Saab Mk3E ASMD CMS has been adapted to take advantage of it.

The initial CEAFAR/CEAMOUNT installation will allow five targets to be engaged simultaneously (four using CEAMOUNT and one using the CEROS 200); a software upgrade planned for 2013 will increase this number significantly although the exact number is classified.

It was the technical risk involved in developing the radars and integrating them with the upgraded CMS and missiles that put the project onto the POC list. According to Defence:

> 'There have been no areas of under performance for this Project. As has been highlighted in the 2009-2010 DMO Major Projects Review (MPR) this Project, being developmental in nature, has been declared as high risk since inception. During late 2007 it was determined from system engineering reviews and DSTO modelling and analysis that the integration of the phased array radar with the existing *Anzac* class radar systems suggested that existing financial provisions were insufficient to deliver an eight ship Program without a real cost increase.
>
> 'As a direct result, Defence reviewed the acquisition strategy for the Project and modified it to a single ship installation that would need to prove the capability at sea before consideration was given by Government to install into the remaining ships within the class. Government agreed to this updated strategy in July 2009. To closely track the progress under the single ship acquisition strategy, this Project was placed on the Projects of Concern List'.

The original plan was to upgrade all eight *Anzac* frigates under a single, fixed-price contract—rather like the FFG upgrade and the acquisition of the *Collins* class submarine and *Wedgetail* Airborne Early Warning & Control (AEW&C) aircraft. After studying the risks, however, the DMO adopted instead a '1 + 7' acquisition strategy, in which a lead ship would be upgraded and tested before approval was granted to upgrade the remaining seven.

This revised approach incorporated a risk reduction process that included both land-based trials of the radar and missile seeker head and a sea trial aboard HMAS *Perth* in late-2008. This proved an important element of the PAR technology—the radar's ability to hand a target track seamlessly from one antenna face to the next on a pitching, rolling warship.

At the end of 2009 approval was granted for the first article installation aboard HMAS *Perth*. The ship was modified by constructor BAE Systems (under the *Anzac* Ship Alliance) at the maritime Common User Facility (CUF) at Henderson, WA. The installation of the new main mast, radars and other elements of the upgrade was completed in November 2010 and HMAS *Perth* was towed to Fleet Base West to begin final fit-out and harbour acceptance testing.

This was carried out in December and January while HMAS *Perth* was alongside, using RAAF and other aircraft as targets for the radars and IRST. The ship began her sea trials at the end of February, culminating in May in a complete engagement against an air target off the East Coast, including a live missile launch, using the full capabilities of the Stage 1 upgrade. By the end of May 11, the final requirements validation and verification report will be generated. No failures are indicated by initial data, but the complete validation and verification report will not be available until mid-Jun 11. The project seems to be tracking well at the time of writing: 'Results to date of the integrated phased array radar system ... have been pleasing, achieving the expected level of integration during testing conducted to date', according to Defence.

Assuming the trials are successful, government is expected to approve later in 2011 the Phase 2B upgrade for the remaining seven *Anzac* class ships, with a view to completing the upgrade by 2018, subject to Navy acceptance and any additional requirements added. The installation process will likely also include the installation of a new Electronic Support (ES) system for the *Anzac* frigates to be acquired separately under Phase 4A of Sea 1448; this sub-phase received 1st Pass Approval in February 2011.

In many respects the *Anzac* frigate ASMD program is a model of its kind, and was featured as a case study in the 2010 Defence Industry Policy Statement. Previously, the DMO has sought to deliver complex, risky developmental projects such as the *Collins*, *Wedgetail* and FFG Upgrade under a single, fixed-price contract with a firm delivery deadline and system performance, specified in considerable (and premature) detail. That approach has set these projects up for disappointment by failing to acknowledge the technical uncertainties and resulting schedule and performance risks. Put bluntly, the DMO and contractors, in a conspiracy of optimism, have failed to manage and then live up to stakeholder expectations.

By contrast, the risk management and mitigation in Project Sea 1448 Ph.2B has been exemplary. By adopting the '1+7' acquisition strategy, Defence and the contractors were able to identify and mitigate risks in a sequence of decisions, trials and approvals which has calibrated accurately the expectations of all parties and helped control cost and schedule.

And illustrating an enlightened approach to sustaining the health of a Priority Industry Capability (PIC)—in this case High Frequency and Phased Array Radars—when the acquisition strategy was changed, DMO managed to allay CEA Technologies' concerns at the resulting production delays. It agreed to a graduated release of project funding to acquire long-lead items for the PARs for all eight ships and to produce sub-assemblies for ships two and three. This has helped sustain CEA Technologies and its suppliers through the trials phase and ensures a rapid production ramp-up once approval is given to upgrade ships two to eight. However, the BAe production team at

Henderson, WA, which built and installed the new main mast, has been laid off and will need to be recreated to implement the upgrade on the remaining seven ships.

The risk with the '1+7' approach is that some of the IT components (though not PAR components) installed on the last two or three ships will be obsolete before installation. (This was a problem also with the original combat system on the *Collins* class submarine.) There is a program in place to manage a minor upgrade of IT components in the *Anzac* frigates' upgraded CMS. But achieving this on an in-service system that actually works is easier than trying to implement it on a developmental system which doesn't—an important lesson from the *Collins* project.

SEA 1448 Ph.2B is anomalous also because high-technology, high-risk developmental projects, almost by definition, require a close and enduring partnership between the contractors and the customer. This isn't something the DMO has always been comfortable with, as it requires an early decision to concentrate on a promising technology development and reduces its ability to stage a competition. Furthermore, it's arguable that the DMO's processes have become increasingly geared to the lower-risk MOTS acquisition environment and are less able to handle the uncertainties of risky developmental programs. But in this instance there was little choice. As the abortive Anzac Warfighting Improvement Program (WIP) showed during the 1990s, the *Anzac* frigates were not capable of being fitted with the bulky air defence systems developed for larger ships, necessitating a novel approach.

SEA 1448 Ph.2B has created a template for managing risky, developmental programs which addresses the ambiguities and uncertainties inherent in high-risk technology projects and is a model Defence, the DMO and the government might follow when embarking on developmental projects in the future, especially the Future Submarine under SEA 1000.

SEA 5000: The Navy's Future Frigate

Tom Muir

The May Defence White Paper *Defending Australia in the Asia Pacific Century: Force 2030* states that the RAN will receive a fleet of eight new Future Frigates. They will be larger than the *Anzac* class ships they will replace and will be designed and equipped with a strong emphasis on anti-submarine warfare (ASW). They would also be fitted with a land attack cruise missile (LACM) capability.

While First Pass approval—the go-ahead for this project—possibly won't occur until 2021, the plan is to approach the market in the near future to obtain estimated cost, capability and schedule information to assist in refining the preliminary requirements. These will likely be followed by formal requests for information or proposals to elicit more robust information.

The SEA 5000 project, which is costed at 'greater than $10 billion', will begin with funded studies to explore the ship platform, combat, and support system options in the quest for an affordable *Anzac* replacement. And, in acknowledgement of the common need among smaller navies to amortise the overheads in ship design as much as possible through strategies such as using of shared components and logistics, the RAN is showing interest in a number of new ship designs.

According to the latest Defence Capability Plan (DCP), the acquisition strategy will be developed to encourage an open and competitive environment, in which a range of options can be explored to identify the projected costs, schedules and risks involved.

Ship design

What sort of a ship does this country need as a replacement for the *Anzac* class? The DCP provides little detail of the 'next-generation combatant'. However, presumably it will broadly conform to new and emerging concepts in the design of naval frigates of around 5000-7000 tonnes due to enter service by the 2020s or even earlier. These concepts include developments in hull design, stealth, propulsion systems, sensor technologies, communications, offensive and defensive systems computerised management systems and improved sustainability.

And if they prove successful in the *Anzac* anti-ship missile defence project (see accompanying brief) it would seem logical to retain locally-developed technologies such as CEAFAR and CEAMOUNT radar systems. While ASW is seen as a priority mission for the RAN Future Frigate, mission or role flexibility remains an important characteristic of warships in a fleet the size of the RAN.

The ADF of 2030 will need to be a more potent force in certain areas, particularly anti-submarine warfare (ASW) and surface maritime warfare (including air defence at sea). The Future Maritime Operating Concept 2025 (FMOC 25) sees the future maritime force (FMF) as being prepared to contribute to conventional coalition combat operations at potentially high tempo and levels of threat during the next two decades and that it should also be prepared to contribute to combat operations against insurgent groups, including groups employing maritime terror tactics. It also suggests that the 2025 battlespace will require highly responsive command and control systems and battlespace awareness to ensure the effective engagement and prosecution of maritime, land and air targets. And, while the engagement grid should include use of lethal and non-lethal systems, the FMOC25 acknowledges the obvious—that the capability to strike targets at sea and ashore is enhanced through the availability of systems with increased range, speed, precision and responsiveness.

According to the FMOC25 measures that individually and collectively will enhance the future frigate's sustained presence in an area of operations include:

- increased system redundancy and commonality through the force
- high platform endurance, possibly including the use of alternate propulsion systems
- flexible designs that permit operation of platforms across the wide range of environmental conditions expected and
- deployment of uninhabited systems and remote sensors/weapons.

But this relatively optimistic assessment of future maritime operations, which overlooks the potential dominance in our region of blue-water navies now being built, and sophisticated submarines now on the horizon, makes no mention of the proliferation of very advanced anti-ship missiles, mainly of Russian origin, designed to destroy targets protected by sophisticated active defences and countermeasures.

The emphasis on ASW for the RAN's Future Frigate is unsurprising. As has been pointed out by ASPI in periodic assessments of Australia's naval capability, anti-submarine warfare (ASW) is a continuing major capability shortfall. Faced with a region that is rapidly developing the ability to operate a range of very sophisticated submarines, Australia cannot expect to be able to conduct major naval operations in the future without a major upgrade to its ASW capabilities.

As a brown/blue water, sometime ASW frigate, the future FFH will require a highly integrated sonar suite providing ASW defence, torpedo detection and countermeasures. From a platform perspective, a quiet hull such as the Type 42, (hydrodynamic performance) and quiet running propulsion and power generation systems, are prerequisites of an effective ASW design. The frigate's ASW capabilities are likely to include towed, variable depth and bow mounted sonars, with multi-frequency systems a consideration according to mission and environment. An ASW helicopter with dipping sonar, together with sonobuoys and multi-role air/surface-launched torpedoes (MU90, Mk 54 or a later replacement) will be important features, together with unmanned aerial systems for surface surveillance.

In an network-centric warfare (NCW) environment it goes without saying that while the Navy's future frigates will need to operate cooperatively on ASW missions with dipping/towed sonars, their data output will need to spread further than to the embarked helicopter, and will require links to other sea, land and air systems.

Other phases

The SEA 5000 Next Generation Combatant has two other phases. Phase 2, with a budget of $1-2 billion, is for the acquisition, storage and support (including test and evaluation) of the stockpile of weapons (above and underwater) for the future frigate fleet. This phase does not include the maritime-based land attack weapon which will be acquired, maintained and stored under Phase 3.

So what weapons will be under consideration for the future frigate requirement? The current *Anzac* class sports ESSM anti-air and *Harpoon* anti-ship missiles, together with a 127mm Mk 45 gun. While the DCP's emphasis appears to be on US acquisitions, one would expect the future frigate to be equipped with more advanced or evolved defensive and offensive systems than current weapon systems. The gun might still have a role but perhaps more as a rocket propelled 'missile' launcher. No doubt an advanced MU90 torpedo, or a US-sourced later block Mk 54 (as may be carried on the helicopter should the USN's Romeo *Seahawk* win that competition) will also be available.

Phase 3, which has a budget of $300m to $500 million, is for the acquisition of a maritime-based strike weapon. Defence would prefer a weapon common to the land attack capability which will be installed on the future submarine and also on the Air Warfare Destroyer. This suggests a *Tomahawk* TLAM-C or whatever further development of the TLAM emerges. While the destructive effects of the TLAM, including submarine launched versions, have been widely demonstrated recently, these have been during uncontested missions where stealth and evasive manoeuvre have not been required.

There are more capable stand-off anti-ship and land attack missiles available, such as the Kongsberg NSM in its various guises, possibly including submarine launched versions, however it seems that the FMS die has been cast in respect to missile acquisitions.

UK Type 26—Future Frigate candidate?

So will the British Type 26 design be a RAN Future Frigate candidate? The Future Surface Combatant (FSC) has been a long running, off-and-on, United Kingdom program to replace the Royal Navy's Type 22 and Type 23 frigates.

Although more off than on—at times FSC was little more than an umbrella for funded studies such as BMT's research on fast ship enabling technologies—it nevertheless encouraged shipbuilders and designers to offer their design concepts for the Type 23 frigate replacement over the past decade.

The FSC program finally got underway in March last year, with a GBP175 million four-year contract awarded to BAE Systems Surface Ships to undertake the assessment phase of the first (C1) Type 26 combat ship due to enter service in the early 2020s. The FSC program was to comprise two classes of warship. They are: C1 (Type 26)—an ASW task group enabled platform and C2, a more general purpose platform.

Working with the UK Ministry of Defence (MOD), BAE design aims for the Type 26 are for a ship that is:

- versatile - able to undertake a number of roles
- flexible - to adapt to the changing needs of defence
- affordable - both in build and support through its service life
- exportable - designed with the international market in mind.

Reportedly, a baseline design suggests a 141m long vessel, displacing 6850 tonnes, equipped with a towed low frequency sonar array and advanced air defence systems.

It's also anticipated that the Type 26 will have either an all electric or hybrid electric propulsion system, providing a range of 7000nm at 18 knots with a maximum speed of 29 knots. The ships complement is expected to be in the region of 150 plus an embarked force of over 30. Main gate approval—similar to our second pass—is anticipated towards the end of 2013, with production starting soon after. The lead ship is planned to be in service in 2021, some eight to nine years after main gate.

At this very early stage in the development of both the RAN's Future Frigate and the RN's Type 26 concept frigate, there is one aspect that particularly favours a collaborative RAN/RN program—the schedule. BAE Systems has indicated that the aim is to deliver the first Type 26 frigate in 2021, well ahead of the planned Initial Operational Capability (2028-29) for the RAN program.

But while Australian interest in the UK Type 26 program has been ongoing and may eventually bear fruit, there is no indication at this early stage that such may be the case. Indeed there is more likely to be a dearth of common ground between the Australian Navy's requirements and those of the Royal Navy and a one-size-fits-all

global Type 26 may not suit our very different maritime environment or strategic outlook. (Or the shipbuilding aspirations of various players in the Australian marketplace and polity.) And the Type 26 concept is by no means the only design with development and build timelines in broad harmony with SEA 5000 planning.

Navantia multi-mission future frigate

At Euronaval 2010, Navantia of Spain introduced its 5000-tonne F2M2 trimaran guided-missile frigate (FFG) design, which has a length of 140 metres, beamwidth of 30 metres, draught of 5 metres, and a displacement of 4,000 metric tonnes. The on-board multi-spectrum sensor systems are totally integrated into the warship's superstructure, and it has no mast.

Eight anti-ship cruise missiles are positioned in the superstructure, and a large platform provides two landing spots for medium-lift multi-role helicopters. The warship also has space for installing vertically-launched surface-to-air missiles (SAM), one 76mm main gun and one 30mm cannon, and can also launch rigid-hulled inflatable boats (RHIB).

The F2M2's propulsion system (using a configuration comprising a combined diesel-electric engine and a gas turbine driving two electric motors, and one gas turbine driving three water jets) will enable the vessel to reach speeds of more than 30 Knots. Crew complement is expected to be about 150.

DCNS Advanseas

French shipbuilder DCNS has proposed its ADVANSEA (ADVanced All-electric Networked ship for SEA dominance) as a concept aimed at meeting the challenges navies are likely to face from 2025. Presented at Euronaval 2010, the concept ship is described as a next-generation all electric surface combatant.

In its approach to designing and building a warship offering improved sensors, safety and stealth as well as compliance with environmental standards, the DCNS design team aims to manage and coordinate three disruptive technologies. These are:

- superconducting electric propulsion motors combining energy savings, reduced weight and size and optimal power ratings (10 MW/motor)
- impulse energy storage devices that promise the instantaneous availability of large pulses of power
- real-time power flow management to users thanks to the convergence of combat system and platform management system technologies.

In each of these areas, DCNS says its engineering teams are working on the practical integration of these technologies in a shipbuilding environment.

In terms of naval missions, the aim is to design a warship for use in regional conflicts with a risk of intense combat. This means designing a ship combining improved means of threat detection, the capacity to respond quickly to such threats using gradual- and decisive-response weapons, and greater safety and comfort for the ship's crew. DCNS says the first demonstrators may be available towards 2018.

FREMM

Another design of possible interest for the Australian Future Frigate is the Franco/Italian Frégate Multi Mission or FREMM program, for which the French first of class *Aquitaine* is about to undergo sea trials. For French shipbuilder DCNS, the FREMM Program comprises twelve units, eleven for the French Navy and one for the Royal Moroccan Navy. Italian shipbuilder Orizzonte Sistemi Navali will deliver ten frigates for the Italian navy with first commissionings anticipated next year (2012).

Three versions will be built by both countries—ASW, anti-air and a general purpose (land attack) version. The frigates will have a displacement of 6,000 metric tons, somewhat smaller than the 6,700-ton *Horizon* frigates currently being built by the two nations, and will be powered by a LM 2500 gas turbine and electric propulsion. The vessels are 142 metres long with a maximum width of 20 metres. Endurance is 6,000 nautical miles at 15 knots with a top speed of 27 knots. Crew complement varies between France 108 and Italy (145). Whether the RAN will be interested in introducing into service a design that reflects the here and now, rather than the 2020s, is a moot point.

Local build or import?

According to the Defence Capability Plan, in the interest of self-reliance there will be a focus on the capacity of Australian industry to maintain, repair and adapt the mission systems, and the ships on which they are embarked. These are primarily systems integration and ship repair capabilities. Noting that naval shipbuilding is a strategic industry capability, Defence may consider options to promote industry's capability to manage the design, integration, construction and testing of the ships.

Another purchase from Navantia of Spain may again suggest an overseas build of the bare hull to be equipped locally with the high end systems, as with the LHDs. Perhaps local builders BAE Systems and ASC might compete with South Korea or Singapore for the construction of steel hulls, in other cases. For a complex multihull aluminium design it would be difficult not to award it locally to ship designers and builders experienced in this specialised field.

Last year (2010) ASPI canvassed a range of government and industry players for their views on the future of Australia's naval shipbuilding and repair industry. Some common themes emerged: the challenge to develop the capacity to deliver the future, the need to manage the workflow for industry to avoid a 'boom and bust' pattern, and the need for Australian industry to be competitive in a global marketplace.

In his contribution, *Building the Fleet of the Future*, economist Henry Ergas said that decisions about where production of the future fleet is undertaken should be made on the basis of securing value for money, without giving any special preference to Australian industry, other than where that preference is a way of acquiring defence outputs that are valued in themselves.

Ergas says the main factor increasing production cost is rising vessel complexity, which involves not merely more sophisticated weapons and control systems, but also changes in vessel structure (such as complicated shapes and ever greater use of new materials) that are aimed at increasing survivability and reducing the vessel's signature.

CHAPTER 10 – AUSTRALIA'S FOREIGN AID

Australia's foreign aid is administered by the Australian Agency for International Development (AusAID). The aim of Australia's aid program is to 'reduce the number of people living in poverty in developing countries in the Asia Pacific and beyond. By doing so, the aid program also advances our national interest through promoting a more stable and prosperous region and world'.

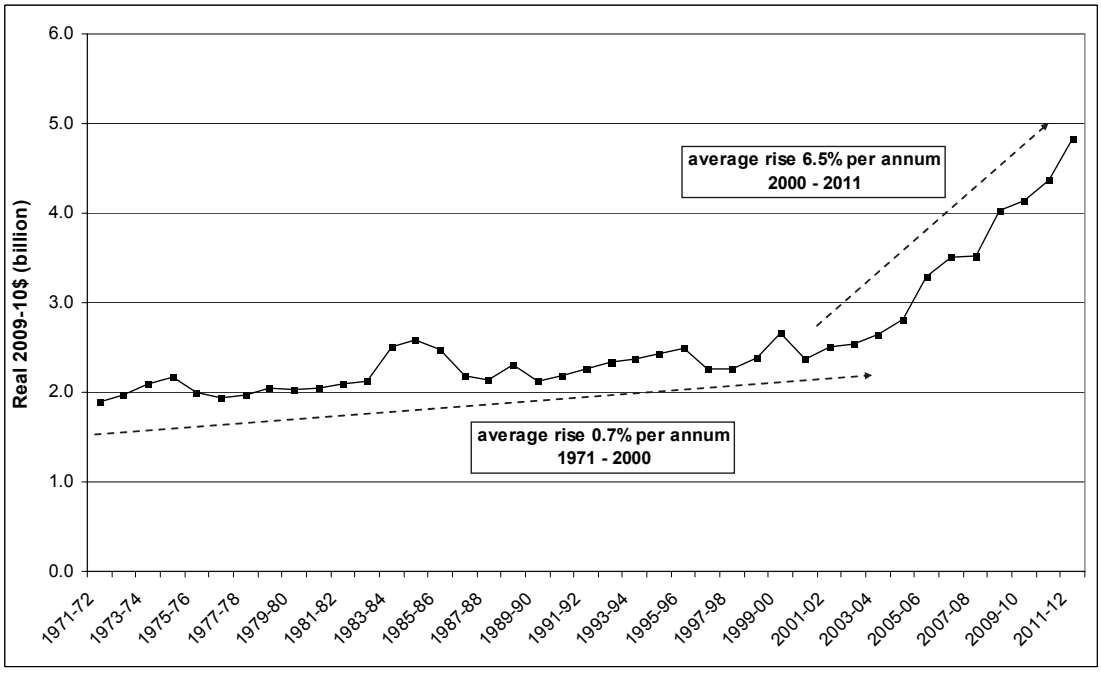
Australia's strategic interests are an important subset of its national interests. In this chapter, we examine the overall foreign aid program with a focus on how it furthers our strategic interests. Extensive details of aid initiatives in specific countries are available on the AusAID website www.ausaid.gov.au. Also, the *Ministerial Statement on International Development Assistance* released with the 2011-12 Budget is clear, comprehensive and readable.

How much does Australia spend on foreign aid?

In 2011-12 Australian foreign aid will amount to $4.8 billion corresponding to 0.35% of GDP. This is a nominal boost of $474 million on last year, and 8.4% annual growth in real terms. After a pause in 2009-10 due to the GFC when growth was limited to 0.6%, foreign aid has been increased above trend for two years in a row.

This year's increase completes a longer period of strong growth in the aid budget. Since 2000-01 foreign aid has increased in real terms by an average of 6.5% per annum—around twice the underlying long-term growth in the Defence budget. But things have not always been so favourable for Australian foreign aid. Prior to the present decade, aid spending grew relatively more slowly (0.7% per year in real terms) over the preceding 30 years. Figure 10.1 shows Australian foreign aid spending from 1971-72 to the present.

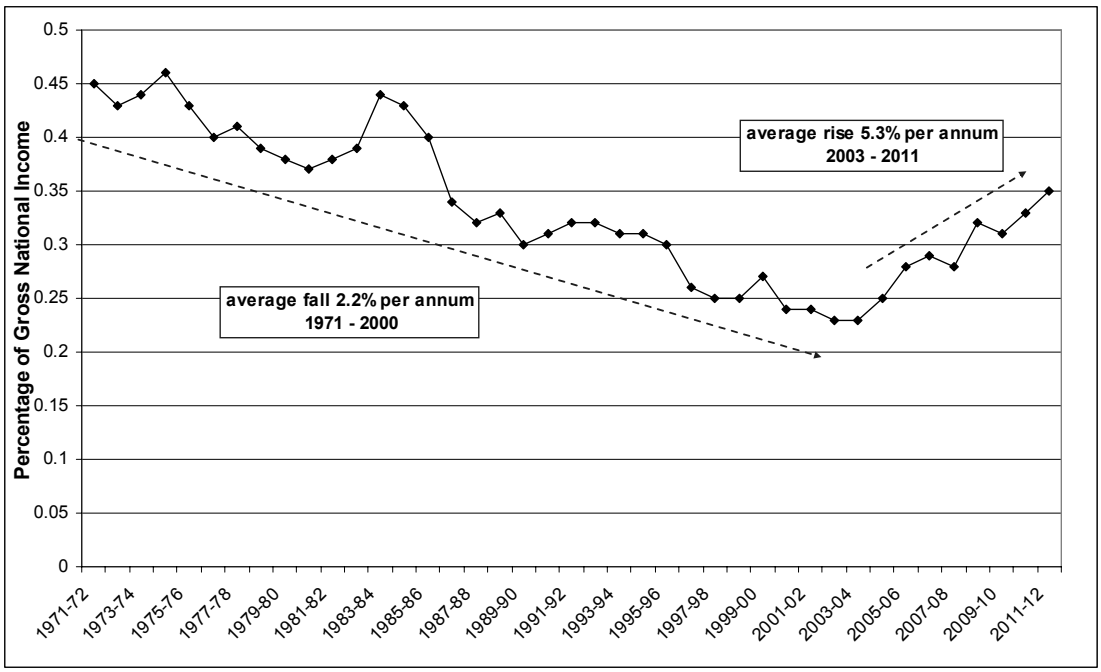
Figure 10.1: Australian spending on foreign aid 1971-72 to 2011-12



Source: 2011-12 Ministerial Statement on Australia's International Development Assistance Program

In much the same way that defence spending is measured as a share of GDP, foreign aid spending is often measured as a share of Gross National Income (GNI). Viewed in this manner, the falling priority accorded to aid from the 1970s to the 1990s is very clear in Figure 10.2.

Figure 10.2: Australian foreign aid as a share of GNI 1971-72 to 2011-12



Source: 2011-12 Ministerial Statement on Australia's International Development Assistance Program

No doubt many factors contributed to a higher priority for foreign aid this century. From a strategic perspective, the eroding conditions in the fragile states on our periphery would be reason enough to do more.

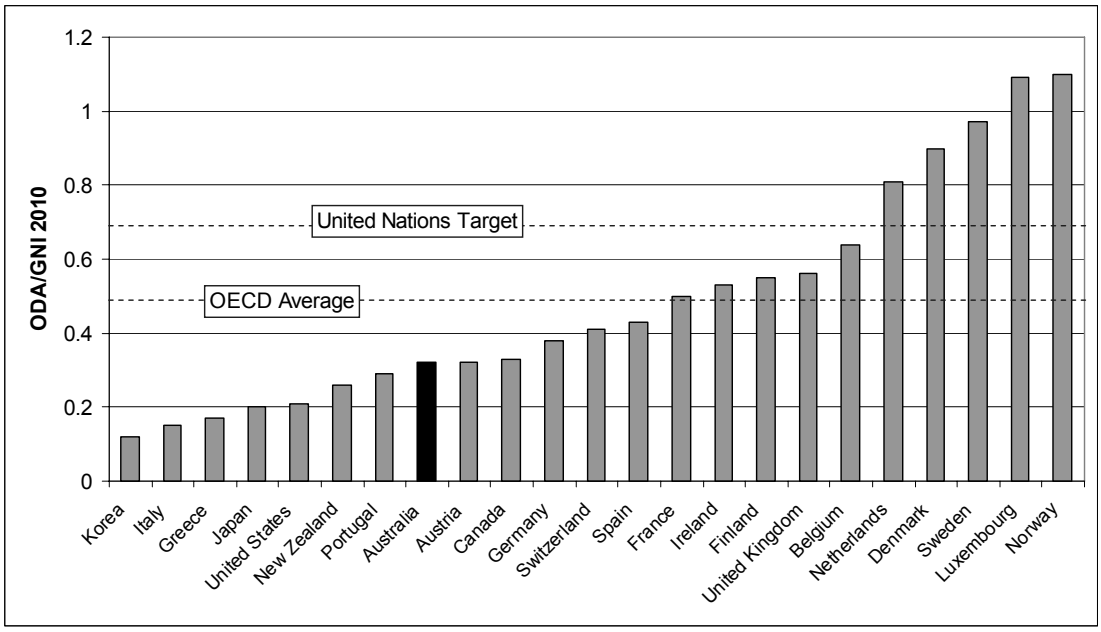
In international terms, Australian foreign aid spending is unimpressive. In 2010, the last year for which comparative data is available, Australia ranked 16th out of 23 OECD countries for aid as a share of GNI, see Figure 10.3. Not only do we fall below the average for industrialised nations, but our 0.35% of GNI is only half of the agreed United Nations target of 0.7%. However, and consistent with its election commitment, the government plans for foreign aid to reach 0.5% of GNI by 2015-16. Specific targets for the next four years are set out in Table 10.1 along with our projection of what will be necessary for the government to fulfil its promise.

Table 10.1: Overseas Development Assistance (ODA) to reach 0.5% of GNI by 2015-16

	Actual				Budget		Estimate			Target
	06-07	**07-08**	**08-09**	**09-10**	**10-11**	**11-12**	**12-13**	**13-14**	**14-15**	**15-16**
ODA/GNI	0.29%	0.28%	0.31%	0.32%	0.33%	0.35%	0.38%	0.42%	0.46%	0.50%
ODA (2010/11 $b)	3.50	3.52	4.03	4.14	4.36	4.84	5.38	6.10	6.84	7.63
real increase	6.2%	0.5%	14.3%	2.9%	5.2%	8.4%	11.3%	13.3%	12.3%	11.4%

Source: 2011-12 Ministerial Statement on Australia's International Development Assistance Program.
Note: projection assumes GNI grows at 2.5% real per annum.

Figure 10.3: Comparison of Official Development Assistance from OECD nations

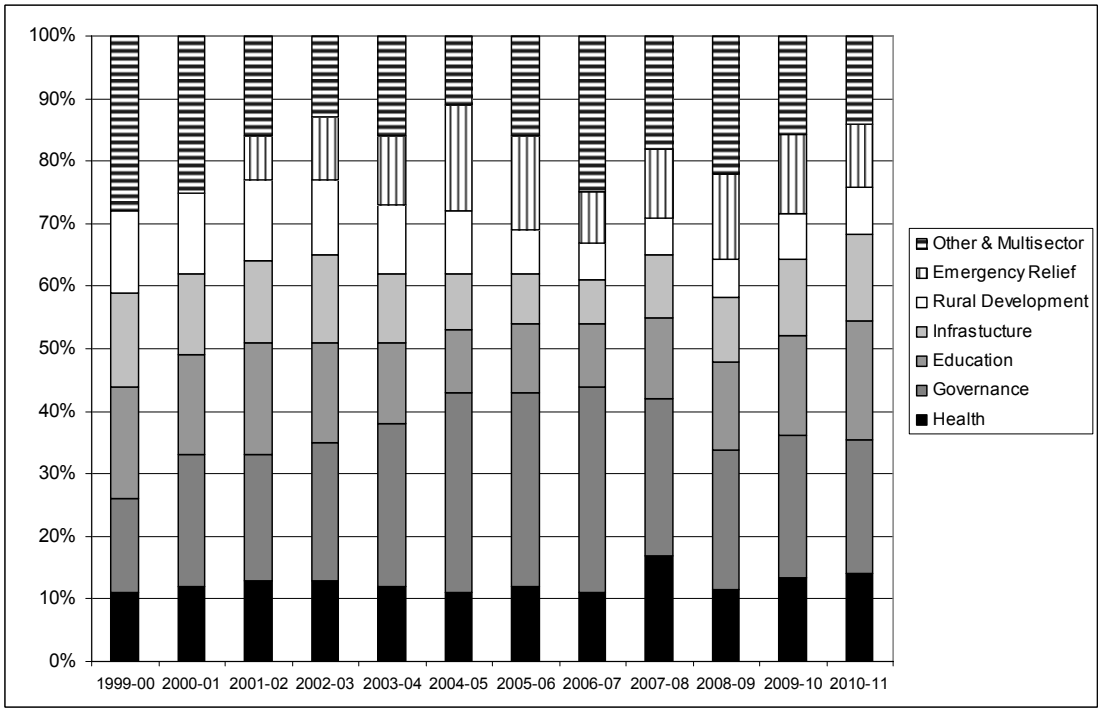


Source: 2011 OECD Factbook

How is the money spent?

At the risk of greatly oversimplifying the complexity of Australia's foreign aid effort, Figure 10.4 sets out the gross categories of aid and how they have changed over the past decade. This year a new categorisation was introduced that will see 19% spent on education, 17% on health, 16% on economic growth, 15% on civil society, justice and democracy, 12% on public sector reform, 5.5% on climate change and environment, 10% on emergency and humanitarian aid, and 6% on multi-sector activities.

Figure 10.4: The composition of Australian foreign aid 1999-2010

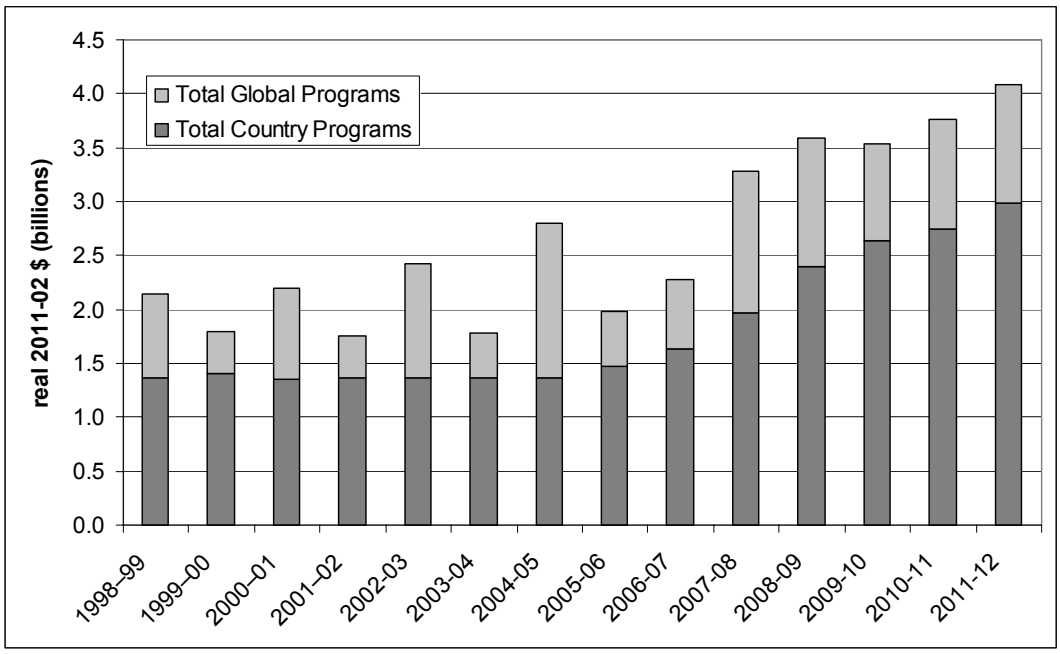


Source: AusAID annual reports and budget papers

Where does the money go?

The annual aid budget is composed of a country-specific program and a global program, see Figure 10.5. The latter includes payments to various development banks and UN and Commonwealth agencies including emergency aid through the World Food Program. Because of multi-year payments, the global program can vary greatly from one year to the next (accrual accounting smooths the payments in reporting).

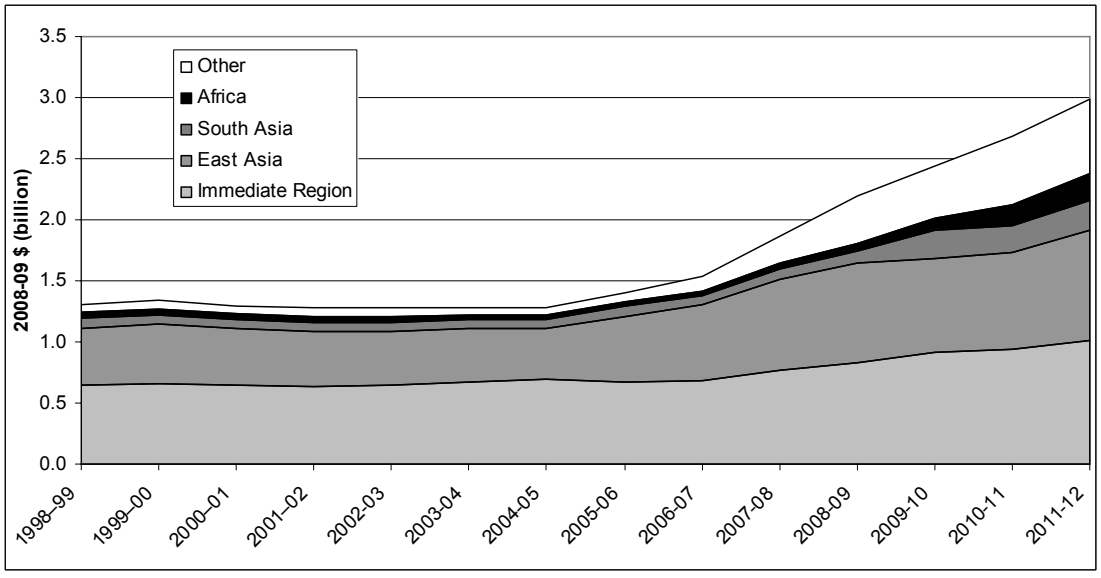
Figure 10.5: AusAID — global and country programs



Source: AusAID annual reports and budget papers – does not include spending by other departments

Australian country-specific aid is mostly geographically focused on Asia and Pacific Island states, although locations further afield are increasingly benefiting. Figure 10.6 shows the size of country-specific aid by region since 1998.

Figure 10.6: Australian aid — spending by region 1998-2011



Source: AusAID annual reports and budget papers

In the past, Australian aid tended to be overwhelmingly focused on countries close to Australia. This priority is still apparent in Figure 10.6 where the category of 'immediate region' includes the island states of the Pacific, PNG and East Timor. Though not shown, most of the aid to East Asia goes to Southeast Asia and to Indonesia in particular.

Nonetheless, recent increases have broadened the spread of funding to more distant locations as shown in Figure 10.6. In part, this reflects substantial new aid to Africa, Pakistan, Iraq and Afghanistan. Over the past decade, aid to the immediate region has increased by 59%, that to East Asia by 103%, South Asia 227%, Africa 362% and other spending 667%.

Table 10.2 lists Australia's country aid by value for 2011-12 (including apportionment from global programs were possible). An additional $1.6 billion is provided through core contributions to multilateral organisations. This country-specific data provides an interesting picture of Australia's aid priorities.

Table 10.2: Australian aid — spending by partner country 2010-11

Country	Australian Aid 2011-12$ (million)	Country	Australian Aid 2011-12$ (million)
Indonesia	558.1	Laos	35.7
PNG	482.3	China	35.7
Africa	291.3	Tonga	32.1
Solomon Islands	261.6	Kiribati	28.2
Afghanistan	165.1	Latin America	27.2
Vietnam	137.9	Nepal	26.6
East Timor	123.7	Nauru	26.2
Philippines	123.1	India	25.0
Pakistan	92.8	Caribbean	20.7
Bangladesh	92.0	Mongolia	12.2
Cambodia	77.4	North Pacific	10.7
Vanuatu	70.1	Tuvalu	9.9
Palestinian Territories	56.0	Bhutan	8.0
Burma	47.6	Maldives	5.0
Samoa	43.7	Niue	4.6
Sri Lanka	43.5	Cook Islands	4.4
Iraq	36.6		

Source: 2010-11 Ministerial Statement on Australia's International Development Assistance Program

How does aid further Australia's national interests?

Aside from making us feel better about ourselves, foreign aid furthers our national interests in two ways. First, bilateral aid to countries establishes a *quid pro quo* that facilitates access to, and influence with, foreign governments. Second, aid can bolster the institutions, infrastructure and human capital necessary for economic development and political stability. The rationale for the first category is self-evident; the second

furthers our national interest by improving the stability of countries important to our security.

Much of Australian aid is entirely of the first sort. The $35.7 million we give to China each year, for example, makes no significant impact on its 1.3 billion people or its economic development. Other aid, like that to Solomon Islands, is directly focused on achieving tangible improvements in governance, human security and economic development.

An informative picture emerges by taking the ratio of Australian aid to a recipient country's GDP. High ratios indicate a real effort to make a difference in a country; small ratios reflect largely diplomatic gestures that will hopefully be repaid through access and influence. Table 10.3 lists Australian aid recipients in descending order of the ratio of Australian aid to national GDP. Not surprisingly, Pacific Islands head the list followed by other countries from the immediate region. Note that some smaller Pacific countries have been omitted because economic data was not available. For comparison, the latest GDP per-capita in PPP dollars has been included as a measure of the relative level of poverty in recipient countries. Clearly, Australian aid is only loosely directed on the basis of need.

Table 10.3: Australian aid as a share of GDP 2011-12 / 2010

Country	Ratio of Australian aid to GDP (PPP)	2011-12 Australian Aid (A$m)	2010 per-capita (US$)	Country	Ratio of Australian aid to GDP (PPP)	2011-12 Australian Aid (A$m)	2010 per-capita (US$)
Tuvalu	62.1%	9.9	1712	Laos	0.2%	35.7	2568
Niue	43.0%	4.6	6206	Bhutan	0.2%	8	5350
Solomon Islands	15.7%	261.6	2996	Mongolia	0.1%	12.2	3531
Vanuatu	5.4%	70.1	5885	Nepal	0.1%	26.6	1284
Kiribati	4.3%	28.2	6634	Indonesia	0.1%	558.1	4601
Samoa	4.1%	43.7	5564	Vietnam	0.05%	137.9	3317
Tonga	3.9%	32.1	6741	Sri Lanka	0.04%	43.5	5243
East Timor	3.8%	123.7	2782	Bangladesh	0.03%	92	1819
PNG	3.0%	482.3	2675	Philippines	0.03%	123.1	3745
Cook Islands	2.2%	4.4	9737	Iraq	0.03%	36.6	3852
Afghanistan	0.5%	165.1	1070	Pakistan	0.02%	92.8	2568
Maldives	0.3%	5	4922	India	0.0006%	25	3638
Cambodia	0.2%	77.4	2140	China	0.0003%	35.7	7918

Sources: 2011-12 Ministerial Statement on Australia's International Development Assistance Program, CIA Factbook
Note: the CIA Factbook estimates of GDP for Tuvalu and Niue are surprisingly small leading to very large aid to GDP ratios.

The level of aid-to-GDP at which aid becomes an entirely diplomatic gesture is impossible to define, though it is hard to argue that figures below 0.5% of GDP reflect a serious effort to have a significant impact—except perhaps in a limited area like governance.

Conversely, it is clear that Australia is trying to make a real difference in those countries where aid approaches or exceeds 5% of GDP. As Table 10.3 shows, this category is entirely within our immediate region.

Australia's military cooperation program

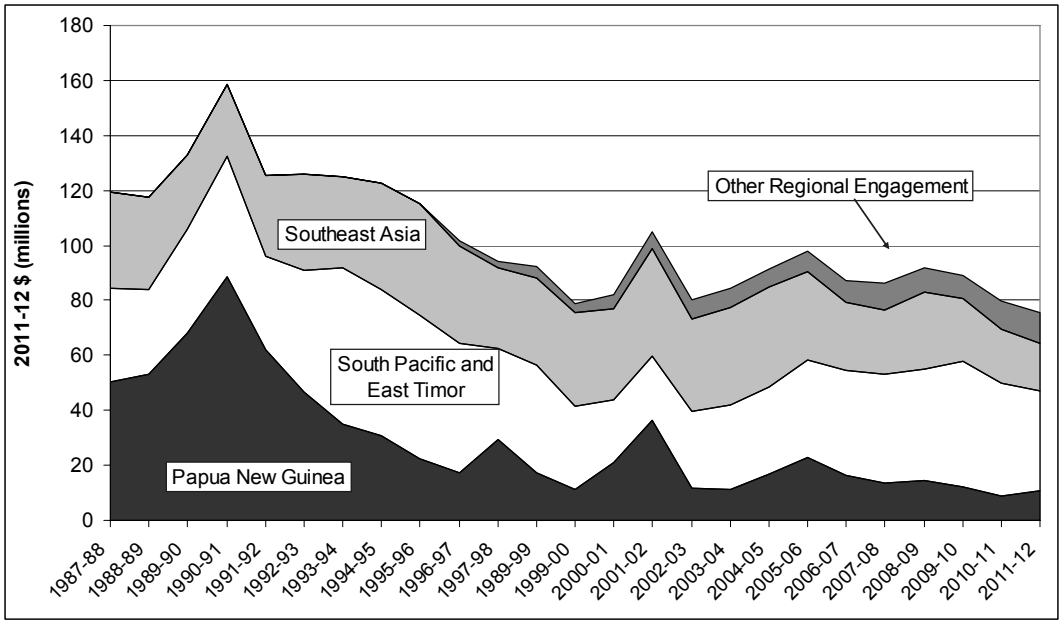
Allied to Australia's international aid effort, is the ~$85 million a year Defence Cooperation Program run by the Department of Defence. According to the 2008-09 PBS, the Defence Cooperation Program supports the government's strategic objectives by:

- contributing to regional security
- working with allies, regional partners and others to shape the global and regional environment in a way favourable to Australia and the ADF
- consolidating acceptance of Australia as an obvious and legitimate participant in deliberations on issues that affect regional security
- encouraging and assisting with the development of defence self-reliance of regional countries.

In practice, the Defence Cooperation Program provides assistance to regional security forces through military advisors, training initiatives, bilateral exercises, capacity building, and equipment and infrastructure projects. A long-standing part of the Defence Cooperation Program is the Pacific Patrol Boat Program that provided 22 Patrol Boats along with training and technical support to12 Pacific Island countries. These vessels allow the countries involved in the Program to independently police their maritime territories.

Figure 10.7 sets out the spending on the Defence Cooperation Program over the past twenty-odd years. For ease of display, individual country spending has been aggregated into convenient categories. Country specific data for 2010-11 and 2011-12 appears in Table 10.4.

Figure 10.7: Defence Cooperation Program—1987 to 2011



Source: Defence Budget Papers and Annual Reports

Table 10.4: Defence Cooperation Program—2010-11 and 2011-12

Country	2010-11 ($'000)	2011-12 ($'000)	Country	2010-11 ($'000)	2011-12 ($'000)
South Pacific			**Southeast Asia**		
Timor-Leste	6,054	6,105	Singapore	80	77
Vanuatu	675	1.,046	Philippines	4.637	3,178
Solomon Islands	478	865	Thailand	2,443	3.079
Tonga	1,250	1,744	Malaysia	3,413	3,445
Western Samoa	136	69	Indonesia	5,552	4,685
Cook Islands	133	99	Vietnam	1,700	1,800
Fiji	-	-	Cambodia and Laos	1,142	1,109
Marshall Islands	351	300	Brunei	34	27
Micronesia	169	154	***Sub-total***	**19,037**	**17,400**
Tuvalu	344	297	Other regional activities	5,080	5,757
Kiribati	280	257	Defence International Training Centre	4,848	5,091
Palau	164	131	**Total**	**77,689**	**75,362**
DCP Housing	1,307	1.2514			
Pacific Patrol Boats	28.745	23.988			
Sub-total	**40,086**	**36,569**			
Papua New Guinea	8,638	10,545			

Source: 2011-12 PBS

ABOUT THE AUSTRALIAN STRATEGIC POLICY INSTITUTE

The Australian Strategic Policy Institute (ASPI) is an independent, non-partisan policy institute. It has been set up by the government to provide fresh ideas on Australia's defence and strategic policy choices. ASPI is charged with the task of informing the public on strategic and defence issues, generating new ideas for government, and fostering strategic expertise in Australia. It aims to help Australians understand the critical strategic choices which our country will face over the coming years, and will help government make better-informed decisions.

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National Security Program: This program covers ASPI's work on Australia's national security priorities, emerging issues, related strategies, and the development of national security arrangements.

GLOSSARY

ADF	Australian Defence Force
AES	Additional Estimates Statements
AEW&C	Airborne Early Warning & Control
ANAO	Australian National Audit Office
APS	Australian Public Service
CDF	Chief of the Defence Force
CIOG	Chief Information Officer Group
CSP	Commercial Support Program
CUC	Capital Use Charge
DAR	Defence Annual Report
DCP	Defence Capability Plan
DFRB	Defence Force Retirement and Death Benefits
DHA	Defence Housing Authority
DMO	Defence Materiel Organisation
DRP	Defence Reform Program
DSG	Defence Support Group
DSTO	Defence Science and Technology Organisation
EWSP	Electronic Warfare Self Protection
FADT	Foreign Affairs Defence and Trade
FBT	Fringe Benefits Tax
FMA	*Financial Management and Accountability Act 1997*
GDP	Gross Domestic Product
GNI	Gross National Income
GST	Goods and services tax
NPOC	Net Personnel and Operating Costs
OPA	Official Public Account
PAES	Portfolio Additional Estimates Statements
PBS	Portfolio Budget Statement
SES	Senior Executive Service

The Cost of Defence

ASPI Defence Budget Brief 2011–2012

RRP $15.00